ANALYSIS OF PROGRAM ACTIVITIES
NATIONAL INSTITUTES OF HEALTH

1956

DIVISION OF BIOLOGICS STANDARDS
DIVISION OF RESEARCH GRANTS
DIVISION OF RESEARCH SERVICES

NATIONAL INSTITUTES OF HEALTH
PUBLIC HEALTH SERVICE
U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

United States. National Institutes of Health.
Report of program activities

Analysis of NIH Program Activities

January-December 1956

Division of Biologics Standards

The task of the Division of Biologics Standards is to determine that there are adequate controls to ensure the safety, purity, and potency of the numerous biological products now used in medical and public health practice. Rapid development of new virus vaccines and other biological products has stressed the importance and relationship of the Division's research activities to its control functions, and the Division has been required to strengthen and expand both its regulatory and its research functions in order to carry out its mission.

The initial goal of the Division -- the strengthening of the program concerned with assuring the safety of the poliomyelitis vaccine -- has been realized. The close cooperation of the manufacturers, the Technical Committee on Poliomyelitis Vaccine, and DBS scientists has made possible the identification and development of corrective measures for a number of technical problems affecting consistent production of safe vaccine. This has required an intensified testing program, close observation of manufacturing processes, and a revision of the original requirements for manufacture and testing. The testing of each lot of poliomyelitis vaccine by the Division has constituted the most demanding activity during the year.

The need for additional space to carry on the activities of the Division has been recognized and authority has been granted by Congress for the construction of a 3½ million dollar building, to be ready for occupancy in 1959. This has required detailed planning of space and facilities by the staff. Additional temporary space was made available during the year in Building 8, permitting an expansion of the laboratory in Building 5.

Continuing investigations include methods of safety and potency testing of poliomyelitis vaccine; methods, preparations, equipment, testing and sterilization of blood and blood products.

In the area of virus vaccine research, the following studies have been initiated: 1) Studies relating to methods of assessing the potency of the polio vaccine have developed some promising leads

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which are stimulating further studies; 2) research directed toward increasing the sensitivity of test procedures by concentration of vaccine suspensions has met with considerable success; 3) the study of a number of human tissue culture cell lines in an effort to find one that will be even more sensitive to poliomyelitis virus than the monkey-kidney-type cell line presently used; 4) the possible emergency of resistant mutants or variants to formaldehyde, ultraviolet light, and other inactivating agents is under study.

In the area of blood and blood products, plans have been completed for a long-term study of genotyping of families with hereditary abnormalities in a search for red blood cells of unusual types. The unusual cells and sera obtained will be processed and used as diagnostic reagents for other tests. They will also serve as an adjunct to the low-temperature preservation of cells which can be stored for as long as six months prior to transfusion, thus providing a reserve of unusual blood when needed for Clinical Center patients.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 1
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Office of the Director
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Program Direction, Administration, and Information
PROJECT TITLE

7. Dr. Roderick Murray
PRINCIPAL INVESTIGATOR

8. Mr. G. A. Brust, Mrs. A. Butterly and Mr. K. Painter
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Plans and administers overall objectives and program of the Division. The two main problems confronting the Division during the calendar year 1956 were (1) to develop an organization capable of fulfilling the mission of the Division and then to begin staffing such an organization, and (2) to develop plans for a new building to house the activities of the Division. Considerable progress was made toward solving both of these problems. Functional and staffing patterns were developed and approved at the Service level, and an increase of 43% in the staff of the Division was accomplished. A significant portion of this increase in staff strengthened and broadened the research capabilities and competencies of the Division. This is essential in the rounding out of a sound biologics control program. There is still a deficiency in the high professional group, however, and considerable effort is being spent on recruitment. Additional laboratory space was made available by rearranging existing space for better utilization. The facilities for scientific investigation were improved by the equipping of these additional laboratories. By the end of the calendar year complete plans for the new building, including the placement of equipment, were delivered to the architect.

The budget was developed and administered and procedures for such operations as supply, personnel, property, etc. were reviewed and improved.

The objectives of the Information Office are to disseminate accurate information on program developments and research programs of the Division, particularly for allied professional groups and the general public.

During the year, this service conducted a comprehensive program of publications and information for the Division. This included the handling of public inquiries, preparation of special reports for Congress, speeches for the Surgeon General, researching, writing, and editing material for various publications, and a variety of miscellaneous activities integrated with the total information program of the NIH.

Efforts have been made to develop new channels for more complete information through use of various public media, including television, press, and motion picture footage. Several publications are planned, such as a brochure on biologics for the Division.

The Technical Committee on Poliomyelitis Vaccine, which met seven times during the calendar year was serviced by this project.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 1
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	113,000	8,000	121,000	5	7.5	12.5

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	6	10	16	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 1
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 2
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. OFFICE OF THE DIRECTOR
LABORATORY, BRANCH, OR DEPARTMENT

4. BIOMETRICS OFFICE
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Consultation with Director, DBS, and other DBS personnel on problems of statistical design and analysis, and biometrics research.
PROJECT TITLE

7. Dr. Max Halperin
PRINCIPAL INVESTIGATOR

8. None
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Other biometrics officers, sections, or branches at NIH, specifically in: NCI, NIAMD, NIMH, NHI, DRS

10. PROJECT DESCRIPTION:

The objectives of this office are threefold:

1. Provision of consultation on problems of statistical design and analysis, as well as such purely mathematical problems as may arise with the research staff of DBS and the Director of DBS.

2. Provision of computational assistance for DBS research staff.

3. Biometrics Research: This largely involves theoretical studies designed to develop statistical concepts and methodology relevant to testing and research problems of DBS. It may also involve research on statistical problems not directly relevant to DBS, such as cooperative effort with biometricians and research scientists of other institutes, and in industry.

In connection with the first objective, during this year a statistical clerk has been hired and the DBS staff can now avail itself of computational service.

With respect to the second objective, a variety of statistical analyses have been undertaken. One example is the evaluation of experimental data bearing on the development of a chick potency test for poliomyelitis vaccine in cooperation with a member of the DBS research staff and the manufacturers of polio vaccine.

Work done under the third objective includes a study on statistical problems in safety testing of poliomyelitis vaccine done in cooperation with other biometricians. This study lays the statistical groundwork for safety testing of a class of vaccines. Another study examining a statistical problem arising in tracer experiments was completed in cooperation with a research scientist of another institute.

Future plans look to a more extensive use by the DBS staff of computational assistance offered by the Biometrics Office, continued assistance in the area of statistical analysis and design, as well as cooperative projects of evaluation and revision of tests and standards promulgated by DBS. In the area of Biometrics Research several statistical problems, including the development of a potency test for poliomyelitis vaccine, are currently being studied and should result in publishable findings. Future work in this area can be expected to develop as problems arise in the course of DBS staff research.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 2
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	15,000	1,000	16,000	1.0	.5	1.5

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	1	2	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 2
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

1. J. Cornfield, M. Halperin, and F. Moore, "Some Statistical Aspects of Safety Testing the Salk Poliomyelitis Vaccine," Public Health Reports, Vol. 71, No. 10, October 1956.
2. M. Halperin and M. A. Walser, "The Reliability of Estimated Rates of Production in Simple Turnover Experiments," accepted for publication, Archives of Biochemistry and Biophysics.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 3
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Control Activities
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Office of Chief, Laboratory of Control Activities
PROJECT TITLE

7. Dr. W. G. Workman
PRINCIPAL INVESTIGATOR

8. None
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Under the Director, Division of Biologics Standards, this project is responsible for the area of activity dealing directly with licensed establishments in relation to the licensing and control of biologic products. This activity is supported by sections on reference standards on control tests and on pyrogens.

The activities include -

(a) Determinations of eligibility of establishments of products for license. This determination being made along the basis of review of integrity of management, review of physical facilities for manufacture and testing, review of scientific and professional qualifications of personnel, and review of evidence of continued safety, purity and potency of licensed products.

(b) Supervision of inspections of licensed manufacturers of biological products and of establishments applying for license.

(c) Release of individual lots of biologic products for distribution on the basis of review of manufacturer's protocols, manufacturer's and NIH tests, and on other data relating to the equality of the individual lot of the product.

(d) The establishment and distribution of physical biological standards.

(e) Review of requirements and Regulations now in effect for such constructive revision as is needed and development of requirements and Regulations required for new products.

(f) Maintenance of close working relations between this laboratory and the other laboratories of the Division in order to insure continuous knowledge of all activities and data needed for licensing, testing, and release of biologic products.

(g) Serving on various committees, such as the Council on Drugs of the American Medical Association, the General Committee of Revision of the United States Pharmacopoeia, and other official and non-official agencies operating in fields of interest similar to or identical with those of this laboratory.

(h) Cooperation with the Department of National Defense and other governmental agencies on problems relating to the control of biologic products.

(i) Maintenance of contact with foreign governments for interchange of information relating to the control of biologic products.

Significance to Public Health and Clinical Medicine

Nearly every person in this country at some time receives a biological product in the course of routine or special immunization against one or more diseases. In addition, medical situations frequently arise in which biological products are administered for immunotherapy or for other reasons as in the case of blood transfusions.

Any failure of the products used to meet acceptable standards of safety and effectiveness may result in serious and even widespread difficulties in medical and public health practice.

Proposed Course of Project

It is proposed to strengthen the control test section by filling the vacancy as Chief of the Section, an additional GS-12 position. This is necessary in order to provide an adequate amount of routine testing to improve the quality of testing being done and to develop more effective methods of testing. The Reference Standards Section is inadequately staffed and it is proposed to fill the position as Chief of this Section.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 3
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	42,000	4,000	46,000	1.0	2.0	3.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	3	4	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 3
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Standardization of Histoplasmin

W. G. Workman, M.D., and G. A. Hottle, Ph.D.

Public Health Monograph No. 39, 1956
Proceedings of the Conference on Histoplasmosis-1952.
U. S. Department of Health, Education, and Welfare, PHS

Standardization and Control of Poliomyelitis Vaccine

William G. Workman, M.D.
(Delivered in Rome, Italy, Sept. 1956) (In Press).
Second International Congress on Immunomicrobiological Standardization.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 4
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Control Activities
LABORATORY, BRANCH, OR DEPARTMENT

4. Control Test Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Control Tests on Biologics
PROJECT TITLE

7. Mr. Robert W. Kolb
PRINCIPAL INVESTIGATOR

8. Mr. Otis L. Green
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

The general purpose of this project is to assure compliance of licensed biological products with standards established in accordance with the biologics control provisions of the Public Health Service Act. Recommendations for release of individual lots of products are made on the basis of evaluation of manufacturer's and NIH tests. The evaluation includes carrying out necessary tests, such as those for sterility, safety, potency, and purity on samples of the biological product.

In addition to the above, this project involves: (a) research designed to improve existing in vivo and in vitro methods of testing and to develop new methods for which there is a need; (b) training activities designed to instruct and orient new government personnel and visitors from both domestic and foreign health laboratories in biologics control testing procedures as carried out at the National Institutes of Health. Cooperative studies are also made in conjunction with the World Health Organization and with other laboratories engaged in studies involving biological products.

Major findings and accomplishments.

(a) Biological products produced by laboratories holding U. S. Government license, both here and abroad, have been tested for conformance to National Institutes of Health requirements.

(b) Complaints from the Armed Forces and other users of biological products have been investigated; reports and recommendations for action made to the Chief, Laboratory of Control Activities.

(c) An increasing number of cooperative control testing services were rendered to several intra-agency laboratories and a number of domestic and foreign governmental agencies in which assays were carried out on numerous biological and pharmaceutical preparations. Official reports of results were made to laboratories or agencies concerned.

(d) Technical assistance was given in collective studies carried out with the Laboratory of Clinical Investigations, NIAID. These investigations pertained to studies of antibody responses in leukemia and in agammaglobulinemia following treatment and administration of various biological antigens. These studies were of value in elucidating the mechanism of resistance to infections frequently associated with the above conditions. The results of these studies were published and reported. [(1) (2) (3) See Part B, item 16]

(e) Cooperated in collecting control activity data for a five-year period (fiscal years 1952 through 1956) and set up a record system for maintaining summary data on control testing activities which will serve as basis for making future trend reports.

(f) Maintained a permanent record and filing system for releases, protocols of manufacturers tests, and samples of all biological products submitted to Division of Biologics Standards. Within the past year was responsible for setting up such a system for the distribution, filing and storage of poliomyelitis vaccine releases, protocols, and samples.

(g) Seventeen visitors representing thirteen foreign countries were given orientation and training in control testing activities during 1956.

(h) Proposed course - To continue the objectives and methods described above, and to further increase effectiveness and research activities with the acquisition of authorized additions to the professional staff.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 4
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	59,000	5,000	64,000	2.0	5.5	7.5

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	4	6	10	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 4
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

C. M. Martin, R. S. Gordon, Wm. R. Felts, and H. B. McCullough with Technical Assistance of R. W. Kolb, J. A. Kasel and C. J. Szwed: Studies of Gamma Globulin.

I. Distribution and Metabolism of Antibodies and Gamma Globulin in Hypogammaglobulinemic Patients. Journ. Lab. and Clin. Med. - In Press.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 5
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Control Activities
LABORATORY, BRANCH, OR DEPARTMENT

4. Pyrogens Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Control of purity and safety of certain biological products as determined by pyrogen test, and total solids, and the stability as influenced by residual moisture.
PROJECT TITLE

7. Mr. Thomas F. Probey
PRINCIPAL INVESTIGATOR

8. None
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

The major responsibility of the project is the testing of certain licensed biologic products for safety, as determined by the pyrogen tests; purity, as determined by total solids; and the stability of dried products, as determined by moisture content. A secondary activity is the control of the trivalent organic arsenicals.

Experimental studies of the pyrogen test have been concerned with the factors influencing the test, especially the techniques of the conduct of the test, and its adaptability as a means of determining the safety of products intended for clinical administration.

Studies to correlate the pyrogenicity of human blood products as determined by the animal test with clinical observation following human infusion continue to indicate the reliability of the test as a means of determining safety.

This project is being done in cooperation with the Blood Bank, Clinical Center, by testing equipment to be used in clinical administration and by testing blood products, especially human plasma prepared from whole blood suspected of causing clinical reactions following infusion. It has also involved cooperation with the Pharmacy, Clinical Center, in testing pharmaceutical preparation developed for use in clinical investigation conducted in the Clinical Center.

This project will provide a means of cooperation with the World Health Organization in the development of an international reference preparation of pyrogens. The principal investigator serves as a member of the U.S.P. panel on pyrogen test.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 5
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	36,000	4,000	40,000	1.0	3.0	4.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	4	5	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 5
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 6
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Control Activities
LABORATORY, BRANCH, OR DEPARTMENT

4. Reference Standards Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Preparation, Standardization and distribution of biological standards
PROJECT TITLE

7. Dr. W. G. Workman
PRINCIPAL INVESTIGATOR

8. Mr. R. P. Miller
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Objectives

Since biological products cannot be standardized, with few exceptions, by chemical or physical means, recourse must be had to testing their effects in relation to physical reference preparations. It is the function of this project to provide these standard preparations for the use of manufacturers and others engaged in standardization. In this way uniformity of potency is established throughout the country. It is largely by the use of these standards that those portions of the biologics law relating to potency can be enforced. A great deal of painstaking and responsible work is necessary to insure that standards issued are satisfactory as official standards for this country and bear a known relation to International Standards.

Methods Employed

Old standards must be replaced as they become exhausted. Standards are required for new products and for certain of the older ones for which it has not been possible to prepare standards heretofore. This is dependent on increasing knowledge in a number of fields, such as immunology, biology, biochemistry, and medicine. Important features of this work are the improvement of methods of storing and preserving standards, such as by freezing and drying so that their potency may be maintained, and to correlate those standards where possible with those established in other countries or with International Standards.

Proposed Course of Project

It is proposed that the project be thoroughly reevaluated from the point of view (1) replacing some standards nearing depletion such as toxins, vaccines, and serums; (2) reinvestigating certain Standards, a few of which are badly needed but not in existence. For example, although poliomyelitis vaccine has been used clinically for more than two years, there is still no reference vaccine preparation suitable for establishment as a national (or international) standard.

Standards and Reference Preparations

A culture collection of organisms used in the production and testing of biologic products is also maintained. Official standards and reference preparations now maintained are as follows:

Anti-A Blood Grouping Serum
Anti-B Blood Grouping Serum
Antimeningococcus Serum
Antipneumococcic Serums (I,II,III,V,VII,VIII)
Anti-Rh Typing Serum-A-B-Rh_o
Blood Group Substances A and B
Botulinus (A) Antitoxin
Botulinus (B) Antitoxin
Botulinus (C) Antitoxin
Botulinus (A) Toxin
Botulinus (B) Toxin
Botulinus (C) Toxin
Cholera Opacity Reference
Cholera Vaccine
Diphtheria Antitoxin

Standards and Reference Preparations, Cont'd.

Diphtheria Antitoxin Flocculating Serum
Diphtheria Toxoid
Dysentery Antitoxin
Fibrinogen
H. Influenzae Antiserum
Histolyticus Antitoxin
Histolyticus Toxin
Histoplasmin
Influenza Virus Vaccine for CCA Titration
Influenza Virus Vaccine for Potency
Ludox Nephelometry Standard
Mumps Reference Serum
Nitrogen Standard (Protein)
Oedematiens Antitoxin
Oedematiens Toxin
Reference Old Tuberculin
Perfringens Antitoxin
Perfringens Toxin
Pertussis Turbidity
Pertussis Vaccine
Plague Agglutinating Serum
Plague Vaccine
Poliomyelitis Control Serum
Poliomyelitis Immune Globulin
Poliomyelitis Vaccine
Poliomyelitis Virus
Purified Protein Derivative of Tuberculin
Rabies Challenge Virus
Rabies Vaccine
Rabies Serum
Scarlet Fever Streptococcus Antitoxin
Scarlet Fever Streptococcus Toxin
Smallpox Vaccine
Sordellii Antitoxin
Sordellii Toxin
Staphylococcus Antitoxin
Staphylococcus Toxin
Tetanus Antitoxin
Tetanus Antitoxin Flocculating Serum
Tetanus Toxin
Tetanus Toxoid (Alum Precipitated)
Tetanus Toxoid (Fluid)
Thrombin
Typhoid Vaccine
Typhoid Turbidity Standard
Typhus Control Serum
Vibrion Septique Antitoxin
Vibrion Septique Toxin

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 6
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	32,000	2,000	34,000	0	4.0	4.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	6	7	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

Form No. ORP-1
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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 6
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 7
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Blood & Blood Products
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Study of Methods, Preparations, Equipment, Testing, and Sterilization Employed in the Production and Utilizing of Blood and Blood Products.
PROJECT TITLE

7. Dr. J. T. Tripp and Dr. Paul J. Schmidt
PRINCIPAL INVESTIGATOR

8. Dr. Sherwin Kevy, Dr. George Pettit, Dr. Richard Suchinsky, Dr. Alexander Breslow, Mr. Paul Fehnel, Miss Ann Dayton, Mrs. Eleanor Morrison, Mrs. Wanda Chappell and Marietta Carr.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Approximately 90% of the time of all employees of the Laboratory of Blood and Blood Products is at present involved in control activities and service functions. The program is in course of expansion and more emphasis will be given to research.

At the present time the various functions of the Laboratory of Blood and Blood Products cannot conveniently be broken down on a sectional basis. The activities of the Laboratory, including the Clinical Center Blood Bank, are here treated collectively.

Objectives: The main research objectives are to develop methods of controlling and standardizing the quality of blood and blood products, study the problem of collection, storage and use of blood, and to investigate the basic immunologic and biochemical properties of blood and blood products. This includes a study of prolonged cold storage of red cells, a study of blood groups, an evaluation of blood bank testing on a national level, a study of the potency and stability of Normal Serum Albumin (Human), and a study of the effects of heating on plasma. An important function of this laboratory is the maintenance and operation of the Blood Bank and transfusion service of the Clinical Center. Major emphasis is on the control of blood and blood products processed by licensed establishments. This involves inspections of approximately 185 establishments, testing of random samples from each establishment, and test and release of each lot of a blood product produced by each licensed manufacturer.

Methods Employed:

1. The study of methods of prolonged storage of blood at temperatures of -20°C. to -45°C. is a continuation of a project begun last year, with viability of cells after storage measured both *in vitro* and *in vivo*.

2. As an adjunct to (1) the efficacy of various storage media are being tested as to their ability to preserve the antigenicity of the red cell after frozen storage. At this time the effects of AB serum and a mixture of Alsever's Solution and albumin are being studied. In addition, methods of storage of red cells coated with immune antibody and preservation of eluates prepared from such cells are under investigation.

3. An investigation is just getting under way to study the effects of various preservative solutions on whole blood and its components. Particular attention will be paid to the sedimentation characteristics of red cells collected with various preservatives and under varying physical conditions.

4. A continuing study of red cell antigens and antibodies is in progress. This study is implemented by the screening of "normal" donors and recipients for the presence of antibodies and unusual red cell antigens. Antibody studies are performed in two ways; the reacting of serum obtained from donors and recipients with a red cell panel of known antigenic structure, and by means of eluting antibody from coated red

cells with subsequent identification by means of a red cell panel. This service is made available to area hospitals and to licensed establishments. In the study of red cell antigens, an investigation was started this year to determine the genotypes of the members of a large inbred family group in southern Maryland. Testing is now under way, but it is expected to take at least several months before sufficient data is collected to enable any interpretation of the results.

5. An investigation has just started on an evaluation of the fluorescein technique in terms of its sensitivity and applicability to blood banking. The reaction between fluorescein-coupled anti-human globulin serum and known antigens will be studied regarding its practicability as a blood bank technique.

6. The Rh variant (D^u) antigen is being studied as to its statistical and genetic significance in the population. Cells with this antigen are also being used to evaluate the effectiveness of diagnostic reagents submitted by manufacturers.

7. In a project designed to standardize blood banking procedures and evaluate sources of blood bank errors several programs were initiated. Primary among these was a voluntary blood bank evaluation study in which standard test blood samples are sent to licensed blood banks for testing. Other aspects of this same study are an evaluation of borderline diagnostic serums by cooperative study with licensed blood banks, voluntary report of errors in blood banks, development of laboratory record forms for blood banks, and development of a method for recording final results of crossmatch tests. Other programs in the same project were the development of a method for coloring one of the copper sulfate solutions used in hemoglobin estimation of prospective donors and an evaluation of isoagglutinin and hemolysin screening procedures for low titer group O blood.

8. A five-year study of the effects of storage on Normal Serum Albumin (Human) is continuing. The material is stored under varying conditions and tested periodically.

9. An investigation has recently been initiated to study the effects on plasma of various physical and chemical treatments. This includes heating and prolonged room temperature storage. The major aim of such procedures is to diminish the hepatitis risk consequent to the infusion of pooled plasma.

10. The Clinical Center Blood Bank is engaged in a cooperative study with the National Heart Institute on the effects of multiple transfusions on patients with sickle cell anemia. A joint project was also entered upon with the National Cancer Institute on the effects of blood and its components in the control of bleeding in patients with acute leukemia.

Major Findings:

During the past year, the following findings have been made:

(1) Storage of red cells for as long as 18 months at -45°C. is possible with *in vivo* survival in human volunteers following thawing comparable to that of fresh blood. As a result of this work the Clinical Center Blood Bank is now storing red cells of unusual blood types which will be available for transfusion to patients needing such blood.

(2) Thus far, the work performed confirms previously published reports that storage of red cells in an Alsever's Solution-albumin mixture is capable of preserving the red cell antigenicity for at least 3 weeks. Eluates from coated red cells have been preserved in the frozen state with success for 18 months thus far. Coated red cells themselves have been preserved for 1 month in the frozen state and 1 month following thawing.

(3) As yet no adequate data is available on the testing being done on the comparative effects of various preservative solutions.

(4) As a result of antibody screening a variety of unusual antibodies have been discovered having specificities of Anti-D, Anti-Le^b, Anti-k, Anti-M, Anti-P, Anti-C, Anti-E, in addition to several non-specific cold antibodies. Of a total of 2,028 donors and 864 patients screened through September, 1956, a total of 38 were found to have abnormal antibodies.

(5) The applicability of dye-coupling to several antigen-antibody systems is reported in literature. The synthesis of the Fluoresceinated Coombs serum has been started but is currently at a halt pending receipt of certain essential chemical compounds. Work will proceed as these materials are acquired to use this technique in study of Coomb's reaction.

(6) Progress on this project has been implemented by the acquisition of a relatively large source of cells having the Rh variant (D^u) antigen.

(7) A good deal of preliminary information has been collected regarding the comparative accuracy of blood bank testing throughout the country. From the information at hand it is evident that techniques in blood banking vary greatly. Also, the need for improved diagnostic sera has been shown. A method for coloring one of the cooper sulfate solutions used in hemoglobin estimation of prospective donors is now in use and a description of the technique has been published.

Screening procedures for isoagglutinin and hemolysin levels in group O bloods were reviewed and their relative merits evaluated, with recommendations for preferred types of testing. This material has been published.

(8) This study has been in progress for 25 months. As yet no evidence of major changes has been uncovered. The critical testing, however, will be at the end of the 5 year period.

(9) Tests are currently being run on heated plasmas from various manufacturers. Because of the small amount of information at hand at this time, no general conclusions can yet be drawn.

(10) Results were published this year on the survival of red cells in patients with sickle cell anemia and the effects of transfusion on these patients. Evidence indicated depression of reticulocyte response by transfusions which maintained the hemoglobin in the normal range. It was also shown that the patients' own cells exhibit a very short survival time.

Investigation of the effects of whole fresh blood on the bleeding of acute leukemia has given evidence suggestive of a beneficial effect with regard to the bleeding. There is no evidence that such blood has any effect in prolonging the total length of patient survival.

During the year the Clinical Center Blood Bank provided services as follows:

(1) A total of 2261 units of blood were collected through October, 1956.

(2) 112 special tests were performed on blood samples from Clinical Center patients at the request of the ward physician. Assistance was rendered to other Institutes in their research projects throughout the year in the form of special donor bleedings, obtaining blood samples, plasmapheresis, loans of equipment, and various other types of special aid.

(3) In addition, the blood bank assisted in special investigations and supplied blood in emergencies to Georgetown University Hospital, Naval Medical Center, George Washington University Hospital, Mount Alto Veterans Hospital, American Red Cross, Walter Reed Army Medical Center, Baltimore P.H.S. Hospital, Leland Memorial Hospital, Emergency Hospital and Quantico Hospital.

Significance of Research

1. Research on methods of blood preservation is directed towards establishing a feasible program of stockpiling blood. This

would be particularly important in times of national emergency and would also enable storage of rare bloods until such times as they are needed. We now have demonstrated the ability to store frozen blood for periods up to 18 months. We have also been able to store sensitized red cells and eluates from such cells for prolonged periods of time. This will enable closer correlation of research work on rare antibodies between various laboratories and will permit storage of such material for further study at a future time.

2. The identification of red cell antigens and antibodies provides data of importance both for the theoretical study of such material and for the practical purpose of increasing the safety of transfusions. Such material serves as a source of diagnostic reagents, this being the only source of such reagents. The availability of this service on a national level allows for more adequate coordination in the investigation of blood problems.

3. The evaluation and standardization of blood banking procedures and blood banking errors is designed to elevate the general national standard of blood banking and medical practice to a uniformly high level. This will not only increase the safety of blood transfusion but, by the uniformity in procedure, will provide a basis for the establishment of product requirements.

4. With the necessity for the acquisition of stockpiles of blood products in preparation for any disaster or national emergency the investigation of changes which may occur to such products during storage and which may effect the potency and safety of such products becomes imperative. This will also enable establishment of realistic dating periods and standards for storage.

5. The risk of hepatitis consequent to the administration of pooled human plasma has mitigated against the use of such materials for human injection, despite the fact that it is more economical than other products used for similar purposes. Evidence is available that treatment of pooled plasma by various physical and chemical means, such as heating and prolonged room temperature storage, is, on occasion, capable of reducing the hepatitis risk. Before such material can be used, however, intensive study must be done on the materials treated in these ways in order to ascertain whether they are safe and potent enough to be used.

Proposed Course of Project

These projects will be carried on along present lines until such time as adequate data is collected. In several of these, as in the albumin stability investigation, the work will be carried on for at least three more years. During the coming months several new projects are proposed. Among these are a study of the clinical significance of irregular antibodies found in normal donors; the production of dried blood platelets and an investigation of their properties and uses; a study of the storage characteristics of fresh and frozen blood in plastic tubing with an eye to simplified storage, identification, and shipping; and the establishment of working standards for Federal licensure of new blood products as they appear.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 7
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	280,000	22,000	302,000	8.50	19.75	28.25

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	15	30	45	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

Form No. ORP-1
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Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 7
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

1. Chaplin, H., Wallace, M. C., and Chaney E. A study of Isoagglutinin and Hemolysin Screening Procedures for Universal Donors. Am. J. Clin. Path. 26, 721-735, July 1956.

2. Chaplin H., Keitel, H. G., and Peterson, R. E. Hematological Observations on Sickle Cell Anemia Patients Sustained at Normal Hemoglobin Levels by Multiple Transfusions. Blood XI 834-845, Sept. 1956.

3. Schmidt, P. J., and Chappell, W. Dyed Copper Sulfate Solution for Blood Donor Screening, Am. J. Clin. Path. 26, 1106-1107, Sept. 1956.

The following publications listed in 1955 project report were not listed in published NIH report.

1. Chaplin, Hugh Jr. Hemolytic Transfusion Reaction Associated with the Transfusion of "Dangerous Universal Donor" Blood. Annals of Internal Medicine, Vol. 43, No. 6, Dec. 1955.

2. Chaplin, Hugh Jr., and Chang, Estelle. *In Vitro* Comparison of the Effects of Four Different Preservative Solutions on Single Donor Blood with Special Emphasis on Rate of Flow. J. of Laboratory and Clinical Med. Vol. 46, No. 2 pp. 234-244, August 1955.

3. Chaplin, Hugh Jr., Chang, Estelle, and Kolb, Robert W. Report of Routine Tests for Psychrophilic and Mesophilic Contaminants in Banked Blood. Applied Microbiology, Vol. 3, No. 4, July 1955.

4. Chaplin, Hugh Jr. A Modified Sterile Pilot Tube for Collection of Donors Blood for Crossmatching. Am. J. Clin. Path. Vol. 25, No. 12, Dec. 1955.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 8
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Bacterial Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Section on Bacterial Toxins
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. (a) Components of Diphtheria Toxin, (b) Evaluation of Diphtheria Toxoids, Using Chicks, (c) Classification of the Neisseria
PROJECT TITLE

7. Dr. Sara E. Branham (Matthews)
PRINCIPAL INVESTIGATOR

8. Mrs. Marion Grabowski and Mr. Donald B. Riggs
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

(a) Components of Diphtheria Toxin.

Objectives: To compare the components of the toxins produced by the gravis type of diphtheria bacillus with those of the "Park 8" Toxin.

Methods Employed: 1. Separation of the toxin components by continuous "curtain" electrophoresis, and characterization by physical, chemical, and biological means. 2. Immunological studies involving preparation of toxoids from the toxins, immunization of guinea pigs with these toxoids, and examination of the resulting sera for antitoxin content by precipitation and neutralization methods. Since antibodies other than antitoxins are also present, these will be studied by agar plate and agar electrophoresis methods, in addition to skin neutralization tests in guinea pigs.

Major Findings: A minimum of three components has been demonstrated to be present in all the toxins analyzed. Most conspicuous has been an active toxic factor which varied in amount from strain to strain. A protein differing from this factor in its mobility and toxicity and a polysaccharide fraction have been identified. Seven different components have thus far been demonstrated.

Significance: From the knowledge gained from this investigation, it is hoped ultimately to be able to (1) improve diphtheria immunizing agents, (2) demonstrate the role of diphtheria toxins in clinical diphtheria, and (3) identify the significant chemical components of diphtheria toxins.

Proposed course of Project: The identification, characterization, and study of the immunological significance of the various components of diphtheria toxin will be continued by the methods outlined.

(b) Assay of Diphtheria Toxoids.

Objectives: To find a simple, reliable assay method for evaluating diphtheria toxoids.

Methods Employed: The chick was used as the test animal. Initially, guinea pigs were vaccinated with diphtheria toxoid, bled after 3 weeks, and the sera thus obtained titrated for antitoxin in 7-8 day old chicks. The technique for such titration has been described previously in the 1954 Project Report in connection with titration of potent commercial antitoxins.

Major Findings: This method seems feasible to an antitoxin level as low as 0.1 unit/ml. When plotted on log log paper, the titration data form a straight line parallel to the line one obtains with the N.I.H. Standard Antitoxin when it is tested at the same levels. Values obtained with chicks are practically identical with those obtained by the more expensive and less satisfactory guinea pig test. It is concluded that chicks are an excellent test animal for the assay of diphtheria toxoids.

Significance: A simple, reliable assay method would greatly facilitate the testing, evaluation, and standardization of diphtheria toxoids.

Proposed course of Project: This project is now completed. The results will be submitted for publication.

(c) Classification of the Neisseria.

Objectives: To review the collection of strains of the Meningococcus for the purpose of establishing "type" strains to represent the classification recommended by the Subcommittee on Neisseriaceae of the International Committee on Bacteriological Nomenclature. This Committee recommended that this project be Undertaken by our Laboratory.

Methods Employed: The cultures of these strains in a lyophilized state have been (1) reconstituted in groups of 16 to 24, (2) plated on blood agar, (3) examined for purity, typical morphology, colony appearance, fermentation reactions, "halo" production, and agglutination behavior. Following preliminary screening, selected strains were studied further for stability, specificity, antigenicity, and inclusiveness for strains of their own serological groups.

Major Findings: Representative standard type strains for Groups C and D have been selected and lyophilized. The final checking on the strains under consideration for Groups A and B is now almost completed.

Significance: The setting up of "type" strains as recommended by the International Committee on Bacteriological Nomenclature will be of great value in facilitating the work of bacteriologists in this field.

Proposed course of Project: It is anticipated that the final checking, lyophilization, reporting, and distribution of these cultures to authorized type culture collections will be completed by May 1, 1957.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 8
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	21,000	1,000	22,000	1.0	2.0	3.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	3	5	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

Dr. Aaron D. Cooper, chemist in the Laboratory of Viral Products of this Division, has done the continuous "curtain" electrophoresis separations with our semi-purified experimental toxins. Serial number: DBS - 17

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 8
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Branham, Sara E. Milestones in the history of the meningococcus. Canadian J. of Microbiology, 2, 175-188, 1956.

Branham, Sara E., Grabowski, Marion W., and Riggs, Donald B. Evaluation of the chick as a test animal in the assay of diphtheria toxoids. (Ready for press. To be in "Applied Microbiology.")

Branham, Sara E. (with Michael J. Pelczar and E.G.D. Murray). Family VIII Neisseriaceae. Bergey's Manual of Determinative Bacteriology. Seventh Edition. In press.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 9
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Bacterial Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Haemophilus Studies
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. (a) Pertussis vaccine - control, immune response, and mouse histamine sensitizing factor, (b) Biologics contamination, and (c) Classification of the genus Haemophilus
PROJECT TITLE

7. Dr. Margaret Pittman
PRINCIPAL INVESTIGATOR

8. Dr. Charles W. Fishel
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Objectives

1. The main control activities of this project are to review protocols, test potency, freedom-from-toxicity and sterility of lots of pertussis vaccine submitted for release and as inspection samples; to test the potency of antipertussis vaccine, and to develop, improve, and revise requirements for

Haemophilus products and the sterility media for the testing of all biologic products.

2. The research activities are largely directed towards studies of immune responses to and the mouse histamine sensitizing factor of pertussis vaccine with respect to the protective and untoward reactive substances of the vaccine for children, and towards an overall understanding of Haemophilus pertussis and its pathogenesis.

Methods Employed

1. For control activities, mouse protective and freedom-from-toxicity tests of release and inspection samples of pertussis vaccine are employed. More than 150 lots were tested for potency, toxicity or for both properties.

2. Evaluation of the potency of pertussis vaccines used in epidemiological studies, for the international standard and substandards in foreign countries.

3. Correlation of the institution of NIH control over the potency of pertussis vaccine with an accelerated decline in death rates followed by a rapid decline in case rates in the U. S. Registration Area.

4. Pertussis vaccine stimulates an early protective response in mice. Studies are in progress to attempt to determine if the responses are due to specific, nonspecific, or interference factors. These include:

(a) Specific early hemolysin response of the mouse to sheep red cells and the effect of X-radiation on antibody production.

(b) Protection of mice following a mixture of pertussis vaccine and challenge culture and the effect of X-radiation on protection.

(c) The effect of endotoxin on early protection.

(d) The effect of the mouse histamine sensitizing factor on protection.

(e) The protective response to differently prepared pertussis vaccines when mice are challenged one to 30 days after vaccination.

5. The chromatographic pattern of pertussis cells and animal tissues after injection of pertussis vaccine.

6. Chemical and spectographic differentiation of low and highly potent vaccines.

Major Findings

1. The analysis of the mortality and morbidity rates of pertussis in the U. S. Registration Area showed that, since the beginning of the potency testing of pertussis vaccine in the 1940's, there has been an accelerated decline in the death rates, and for the first time a drop in morbidity. A marked reduction in the incidence of pertussis, which lagged behind that of the other acute infectious diseases of childhood, has finally occurred. The analysis has been published (Pittman).

2. The publication of the results of the pertussis vaccine field trials in England shows that there is a definite correlation between protection afforded children and laboratory evaluated potency. Through our cooperation in the potency evaluation of the vaccines, we glean the information that our requirement of 12 units per total human immunizing dose is adequate to afford significant protection.

3. In the literature, it was suggested that a 30-day interval between vaccination and challenge of mice in the pertussis vaccine potency test might be better than the 14-day interval. We have found that the same relative potency between a vaccine and the standard is the same at 14, 21, and 30 days. The protective response at different time intervals showed considerable variation, and that early response to differently prepared vaccines varied significantly. Further work is in progress.

Significance

1. The establishment of a U. S. standard of potency in the 1940's seems to have had an influence in bringing pertussis under control in the United States.

2. The required potency of 12 units per total human immunizing dose appears to be adequate to afford significant protection to children.

3. In the study of time intervals between mouse vaccination and challenge, it was found that the same time interval should be used with both plain and mineral adjuvant-containing lots, and that 14- to 30-day intervals can be used. Additional work is in progress to elucidate the variation in early response to differently prepared vaccines. The work should contribute to fundamental information on early immunity.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 9
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	41,000	4,000	45,000	2.0	3.0	5.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	5	7	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

a. Cooperation with Section on Metabolic Enzymes, NIAMD, Chief H. M. Kalckar, by furnishing preparations of different species of *Haemophilus* for the study of a uridyl-phospho-glucosamine enzyme.

b. Cooperation in evaluation of pertussis vaccine for the international standard and for a limited number of lots from foreign countries for specific studies.

c. Cooperative study with Dr. Maurice Landy, NCI, on the effect of endotoxin on early "immunity" to *H. pertussis*.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 9
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Pittman, M. Pertussis and pertussis vaccine control. J. Wash. Acad. of Sciences, 46, 234-243, 1956.

In press

Pittman, M. Symposium on problems in taxonomy. Part 2. Classification of the small gram-negative hemophilic bacteria isolated from the genitourinary tract. Introduction. Bact. Reviews, 20, Dec. 1956.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Councilor, Society of American Bacteriologist, representing Washington Branch - Dr. Pittman

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 10
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Bacterial Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Cancer Products Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Research on Viruses in Relation to Cancer
PROJECT TITLE

7. Dr. Lawrence Kilham
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

(A) Control Work: Includes (1) Scrutiny of protocols from drug companies, and (2) organizing a laboratory which could be used for testing of cancer products.

(B) Study of virus transformation, the conversion of fibroma to myxoma in tissue culture.

OBJECTIVES:

This phenomenon, probably similar to the transformation of one type of pneumococcus into another, has been accomplished hitherto only in live rabbits and has been most unpredictable. Present objective is to carry it out under more controllable conditions and to discover chemical nature of transforming substance, which is conceivably DNA. (Desoxyribonucleic Acid)

METHODS EMPLOYED:

The Shope fibroma virus is grown in the presence of heat-killed myxoma, using cultures of rabbit tissues. Supernatant fluids are regularly tested in rabbits for presence of live myxoma virus. If transformation can be accomplished regularly, effort will be made to extract heat-killed myxoma by chemical means.

MAJOR FINDINGS:

(One-half year's work) Transformation has taken place in a number of experiments. A paper has been published on growth of fibroma virus in cultures of rabbit testes. A recent discovery is that both fibroma and myxoma virus can be propagated in cultures of trypsinized rabbit kidney.

SIGNIFICANCE:

(1) The transformation phenomenon is of basic interest to virus and to cancer research, as was emphasized at a recent meeting of the New York Academy of Sciences. (2) Tumor viruses appear to be quite host specific. Considering that almost none of the group of mammalian viruses which cause benign tumors initially, except fibroma, have been grown in tissue culture, further knowledge of their in vitro requirements should be of value.

(C) To study why a metastasizing sarcoma developes in the cyst wall of a parasite (Cysticercus fasciolaris) in a high proportion of infested rats (up to 90% of inbred lines).

OBJECTIVES:

The Cysticercus-sarcoma complex has been studied for 30 years largely by a single group of investigators, not primarily virologists. Since the Cysticercus is a large larva, forming a delicate cyst wall easily shelled from the liver, it is a convenient subject to study, especially in cooperation with a parasitologist familiar with this tapeworm. Hope is to find out whether a virus or some carcinogen or other substance elaborated by the larva induces the malignancy.

METHODS EMPLOYED:

Attempts to grow virus in cultures of rat embryo tissues, using suckling rat as test animal.

MAJOR FINDINGS:

(Less than 6 months) Entire cysts have been maintained in tissue culture for 4 to 5 weeks. The sarcoma has been maintained by means of periodic transplants in suckling rats.

SIGNIFICANCE:

There are two main approaches to the control of cancer: (1) Use of therapeutic agents, (2) To first gain knowledge of basic etiology. That viruses are somehow concerned in the etiology of cancer is a live hypothesis. As in most other fields of medical research, much of the pioneer work has to be carried out in animals. The thought behind present projects is that knowledge acquired on virus-cancer relations in any animal species has potential value to the understanding, and hence control, of human cancer.

(D) Growth of rabbit papilloma viruses in tissue culture.

OBJECTIVES:

To propagate the Shope Papilloma virus and the oral papilloma virus of rabbits in cultures of rabbit tissues.

METHODS EMPLOYED:

Chief initial problem is mechanics of tissue culture. There has been some success in growing rabbit skin, after several weeks of pretreatment with methylcholanthrene. Trypsinized rabbit kidney cells are also being used.

MAJOR FINDINGS:

None (Less than 6 months' work).

SIGNIFICANCE:

There are a number of papilloma viruses in various mammals and it is hoped to develope methods by which they can be grown in tissue culture and hence studied more thoroughly.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 10
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	35,000	2,000	37,000	1.0	2.5	3.5

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	5	7	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 10
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

1. Kilham, Lawrence. Propagation of fibroma virus in tissue cultures of cottontail testes. Proc. Soc. Exptl. Biol. Med., 92, 739-742, 1956.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 11
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Virus Vaccine Testing
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. (a) Virus vaccine testing (b) Tissue Culture Preparation
PROJECT TITLE

7. Dr. George Hottle
PRINCIPAL INVESTIGATOR

8. Dr. Donald W. McKinstry, Dr. James Crawford and Mr. Charles Rosenberger
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

(a) Virus Vaccine Testing

Objectives: The objective of this project is to test the safety of commercially produced virus vaccines in tissue culture.

Methods Employed: Concentrated and unconcentrated vaccine is tested in tissue culture. The vaccine is concentrated in the

Spinco ultracentrifuge by centrifugation in the #30 rotor at 30,000 rpm. for 3 hours. The sedimented vaccine is resuspended in about 1/20 the original volume and inoculated into monkey kidney cell cultures. The unconcentrated vaccine is inoculated into monkey kidney and HeLa cell cultures. All tissue cultures are observed for cytopathogenesis. Tissue cultures are prepared from monkey kidneys and HeLa cells.

Major Findings: The cell lots formed full sheets of cells in 5 - 7 days. In approximately 140 samples of poliomyelitis vaccine which were tested, no live poliomyelitis virus was isolated. In 13 vaccine tests some cytopathogenesis was observed, but passable cytopathogenic agents were not isolated. Four cell lots showed presence of possible cytopathogenic agents. A passable cytopathogenic agent was isolated from one of these cell lots and is under study in Dr. Li's laboratory. In addition portions of vaccine lots were tested directly in tissue culture without concentration.

Proposed Course of the Project: Safety testing of poliomyelitis vaccine will continue. Safety testing in tissue culture will be expanded to include adenovirus vaccine and other vaccines as they are manufactured.

Investigations to improve methods of producing and maintaining uniform large scale tissue culture will be made. New cell lines will be developed for quantity use as they show promise.

(b) Tissue Culture Preparation

Objectives: To produce tissue culture preparations in quantity; specifically monkey kidney cell cultures.

Methods Employed: Conventional trypsinizing technique as modified by Youngner. 1/

Major Findings: (A) Study of factors influencing growth of freshly trypsinized monkey kidney (MK) cells:

(1) Trypsinized cells held in an ice bath do not grow as well as cells held at room temperature.

(2) Seitz-filtered medium 199 (undiluted form) does not support cell growth as well as non-Seitz filtered medium 199.

1/ Youngner: Proc. Soc. Exper. Biol. & Med. 1954, 85: 202-5

(B) Preservation of monkey kidney tissue:

(1) In vitro

(a) Second generation monkey kidney cells may be preserved for short periods of time by freezing at -70°C.

(2) In vivo

(a) Experiments with monkey kidney cells grown subcutaneously in a heterologous host offer suggestive evidence that, under suitable conditions, these cells may multiply.

(C) Survey to establish the optimal medium for growth of monkey kidney cells; survey to establish the best medium for maintaining monkey kidney cells.

The results of the project are not yet known.

(D) Preparation of monkey kidney tissue cultures:

From January 1956 to November 1956, the following cultures were prepared:

Tube cultures -	71,368
2 oz. bottle cultures -	25,686
32 oz. bottle cultures -	4,684
Total number of kidneys processed -	1,502
Average yield of packed cells/kidney -	2.81 ml

Significance to the Institute: This work contributes to the vaccine testing functions of DBS and research programs involving the use of tissue culture by evolving methods to produce monkey kidney cell cultures and other cell-line cultures more efficiently and reliably.

It is conceivable that with preservation techniques developed for monkey kidney cells, a tissue bank might be established to fill demands when fresh monkey kidney cells are not readily available.

Proposed Course of Project: It is anticipated that further work will be done to determine a method of preserving monkey kidney cells. This will be pursued in two directions.

(a) By freezing techniques.
(b) By establishing growth in heterologous hosts.

Work will also be continued to establish optimal growth conditions for monkey kidney as well as other cell lines.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 11
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	182,000	13,000	195,000	2.0	20.0	22.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	6	20	26	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 11
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Incentive award for modification of a Microscope Stage.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 12
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Testing
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. I. Poliomyelitis Vaccine Testing in Monkeys.
II. Functions Associated With Poliomyelitis Vaccine Safety Tests.
PROJECT TITLE

7. F. R. Abinanti, D.V.M.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

I. Poliomyelitis Vaccine Testing in Monkeys.

For the period from January 1 to December 10, 1956, 166 poliomyelitis vaccine safety tests have been made. Such tests required the use of 3,320 rhesus monkeys. The test method consisted of intracerebral, intraspinal (lumbar enlargement), and intramuscular inoculation of commercial vaccines into groups of 20 monkeys which had been given intramuscular injections of cortisone and penicillin and put under deep anesthesia by the intraperitoneal inoculation of Nembutal. None of the monkeys showed histological evidence of polio infection. There were 12 instances of histopathological lesions in the CNS of test monkeys. These were not poliovirus infection. No agent could be recovered from the fresh CNS material of such animals.

Seven adenovirus vaccines have been tested in a similar fashion to that described for the polio monkey safety test. No CNS lesions were found on histological examination.

In addition poliomyelitis vaccines were tested for potency in monkeys.

This project group also handled the inoculations and bleeding of guinea pigs which were used in the poliomyelitis vaccine potency testing studies conducted during the past year. Three vaccines were tested on 3 separate occasions for a total of 9 tests. This required the use of 820 guinea pigs which were bled twice during the test period. These sera, and those from the monkeys above, were tested in the Serology section under Dr. Baron.

Several commercial poliomyelitis vaccines which had been used in the field have been tested by the usual technique or by intraspinal inoculation alone following complaint. None of these monkeys have shown evidence of polio infection clinically nor on histological examination of the CNS.

This activity also supplies monkey kidneys to be used for tissue culture preparation in this Division and for the units of the NIAID.

The unit has cooperated with various Institutes in providing various organs from the test monkeys.

II. Functions Associated With Poliomyelitis Vaccine Safety Tests.

A. Sensitivity of Monkeys to Poliovirus.

Objectives: To determine the relative sensitivity of monkeys and tissue culture to poliovirus type 1, 2, and 3. Work done with Dr. Baron.

Methods Employed: Pairs of monkeys were inoculated intraspinally with 0.5 ml of 10 fold dilution of poliovirus near the tissue culture infective end point. These monkeys received 250 mg cortisone and 300 unit penicillin intramuscularly and received the poliovirus while under deep Nembutal anesthesia. A second dose of 150 mg of cortisone was given 2 days later.

In a preliminary study one group of monkeys received dilutions of Mahoney virus by intramuscular inoculation. Aliquots of these virus dilutions were tested in tissue culture by the plaque technique. This aspect of the study was done by Dr. Baron.

Major Findings: Most of the work was done with Type I Mahoney virus. In a parallel titration of Mahoney by the intramuscular route, the infective endpoint was at the 0.5×10^{-5} dilution while by intraspinal injection, monkeys were paralyzed to the end of the titrations which was the 0.5×10^{-6} dilutions. The virus preparation contained $10^{7.4}$ plaque-forming units per ml. Three more titrations of Mahoney were done in which monkey and tissue culture infectivity endpoints were reached. It would appear that the monkey was only slightly less sensitive than tissue culture in these very limited studies. In this work the cortisone did not appear to enhance the susceptibility of the monkeys to infection. One titration of Type II, MEF was done. Here the tissue culture had roughly a 1½ log greater sensitivity. Species of blood, oral and fecal swabs have been tested for virus. These studies are still in progress.

B. Centrifugation of Poliovirus.

Objectives: To study recovery of poliovirus after centrifugation in the Spinco Ultracentrifuge.

Methods Employed: Dr. Baron has been conducting studies on concentration of vaccines and kindly supplied to me a Type I Mahoney vaccine. In the two trials in monkeys, 1200 and 1050 ml quantities were concentrated and resuspended into enough material to inoculate groups of 14 monkeys by intraspinal inoculation. The cortisone regime in these instances was 100 mg the day prior to inoculation of the vaccine, 150 mg on the day of inoculation and 150 mg 2 days following. The monkeys were given penicillin and Nembutal as described earlier.

Results: In the 1st test, 4 of 14 monkeys became paralyzed and in the second, 6 of 14. The CNS tissue from the first group has been tested in tissue culture with recovery of virus in each case of paralysis. This has not been typed as yet. All of these paralyzed monkeys showed histological lesions of polio infection.

Proposed Course of Overall Project: Safety testing of virus vaccines by means of the monkey safety test will be a continuing problem. The associated functions will vary from time to time according to current problems.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 12
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	245,000	70,000	315,000	2.50	13.50	16.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	3	15	18	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 12
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 13
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Testing Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Experimental Studies with Poliovirus
PROJECT TITLE

7. Dr. Samuel Baron
PRINCIPAL INVESTIGATOR

8. Dr. Abraham H. Miller and Dr. Hilton Levy
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

I. Genetics, Variation and Selecting of Poliovirus. Dr. Samuel Baron, DBS.

Objectives: To define some of the mechanisms of genetics, mutation, and selection of poliovirus so that virus strains with desirable characteristics can be synthesized.

Methods Employed: Strains of poliovirus with various genetic markers were obtained from other investigators or developed in this laboratory. Studies have been begun to determine whether genetic recombination will occur among these strains of poliovirus. It is proposed that mutation frequency of the traits be determined, the effect of mutagenic agents be studied and the influence of various selective methods be defined.

Major Findings: The genetic traits of heat resistance, plaque size and multiplication at cold temperatures have been established in the Type I Mahoney strain. Selective methods for separating mixtures are under current study. Attempts at recombination by simultaneous infection of the same tissue culture cells with 2 strains of virus are in progress.

Significance to the Institute: Definition of the mechanisms of poliovirus recombination, variation and selection should allow synthesis of strains combining the many desirable characteristics which are necessary for vaccine production. For example, a strain of Type I poliovirus, combining avirulence and high antigenicity, is needed for replacement of the Mahoney strain in the current poliovirus vaccine.

II. Concentration of Poliovirus by Ultracentrifugation. Dr. Samuel Baron, DBS.

Objectives: Establishment of an effective method for concentrating poliomyelitis vaccine for safety testing.

Methods Employed: Study of sedimentation and concentration of live poliovirus in vaccine in the number-30 rotor of the model L Spinco ultracentrifuge.

Major Findings: (1) Calf serum must be added to vaccine before centrifugation to assure effective concentration.

(2) Optimum time of sedimentation and techniques of operation were defined.

Significance to the Institute: Experimental basis for concentration procedure now used in poliomyelitis vaccine safety testing by DBS.

Proposed Course of Project: Determination of fraction of calf serum responsible for effect. Effect of other sera.

III. Effect of Poliovirus Infection on Metabolism of Monkey Kidney Cells. Dr. Hilton Levy, NIAID, and Dr. Samuel Baron, DBS.

Objectives: Study metabolism of infected cells.

Methods Employed: All cells in a culture bottle are infected with poliovirus. Glycolysis and radioactive glycine uptake and distribution were studied.

Major Findings: With Type III (Saukett strain) there is increased lactic acid production and decreased radio-glycine uptake. The infected cells in comparison to normal cells show most change in distribution of the radio-carbon to protein, less change in lipid distribution and least in nucleic acid distribution.

Significance to the Institute: Basic information on mechanism of virus infection.

Proposed Course of Project: Effect of other types of poliovirus. Effect of other viruses and other cell systems. How does virus initiate these changes.

IV. Determination of Ultraviolet Inactivation Rates of Viruses.
Samuel Baron, M.D. and Abraham H. Miller, M.D.

Objectives: To classify animal viruses on the basis of their rates of inactivation by ultraviolet light, and to use this method to identify unknown viruses.

Methods Employed: Aqueous suspensions of various viruses are exposed to UV radiation. Samples are taken at appropriate intervals and assayed for infectivity. Plots are then made for each virus relating decline of infectivity with time of irradiation.

A standard 15 watt germicidal lamp is employed as the UV source; the virus suspension is contained in a large beaker, the layer thickness being about 0.2 cm; agitation is performed by a Thomas shaker. Intensity is measured with an Archer radiation meter.

Major Findings: Inactivation "curves" have been determined for the following viruses: Mahoney, MEF-1, Saukett and Leon poliovirus strains, A_9 and B_2 Coxsackie viruses, ECHO-7, influenza (Lee strain). A very rough plot has been drawn for vaccinia and the viruses of yellow fever and rabbit fibroma are under investigation.

In every case, when the number of surviving viruses is plotted logarithmically against time of irradiation a straight line results over most of the time range. The slopes of the lines obtained for the various strains of poliovirus, Coxsackie virus and ECHO-7 appear to be identical within limits of experimental error. The line for the Lee strain of influenza is much steeper and a preliminary study with vaccinia

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 13
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	42,000	4,000	46,000	2.0	5.0	7.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	5	7	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 13
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

The Effect of Animal Viruses on Host Cell Metabolism
and
Effect of Poliomyelitis Virus on Glycolysis and Uptake of Glycine by Monkey Kidney Tissue Culture
by
Hilton B. Levy and S. Baron

Accepted for publication in the J. of Infectious Diseases

Some Metabolic Effects of Poliomyelitis Virus on Tissue Culture
by
Hilton B. Levy and S. Baron

Accepted for publication in Nature.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Form No. ORP-1
October 1956

Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 14
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Testing Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. A. Functions Associated with the Poliomyelitis Vaccine Safety Test in Tissue Culture.
PROJECT TITLE B. Poliovirus Serology Laboratory of D.B.S.

7. Dr. Samuel Baron
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

A. Functions associated with the Poliomyelitis Vaccine Safety Test in Tissue Culture

Objectives: Establishment of an experimental basis for Poliomyelitis vaccine tissue culture safety test.

Major Findings: (1) Routine determination of the sensitivity to poliovirus of cell cultures before and after use in the safety test indicates high uniform sensitivity of monkey kidney tissue culture.

(2) Routine screening of all sera used in tissue culture safety testing for inhibitors to poliovirus. Any sera which would decrease the sensitivity of the test are detected and discarded.

(3) Testing of different types of tissue culture for sensitivity to poliovirus. Of the numerous cells tested (Eagle's KB, Leighton's foreskin, Osgood's J96, Baron's LAC, MAF fibroblast, human conjunctiva, and human embryo kidney), none were found more sensitive to poliovirus than monkey kidney cells.

(4) Study of the effect of pH 9.2 medium on the sensitivity of monkey kidney tissue cultures to poliovirus has yielded suggestive evidence that this test may detect live formalin-treated virus when the test at pH 7.6 does not. Gathering of data sufficient for statistical analysis is continuing. This work is being done in comparison with studies by Dr. Abinanti on intraspinal sensitivity of cortisone-treated monkeys to aliquots of the same infectious materials.

(5) Establishment of procedures and techniques for cultivation of various continuous cell strains. This was an effort to be ready for the use of these cells in vaccine testing when the occasion arises. One such cell (HeLa), with the necessary cultivation techniques, is now in use for testing adenovirus vaccine. Studies are now being done to grow these cells as tumors in rats. It is thought that such a system would provide a simple source of great quantities of these cells.

Significance to Institute: Provides continuing development and control of tissue culture safety tests.

Proposed Course of Project: Further development along present lines.

B. Poliovirus Serology Laboratory of D.B.S.

Objectives: Establishment of a laboratory to do the immunological work necessary to process poliovirus vaccine, to develop new or improved tests for poliovirus vaccine, and to service the research function of the Division.

Methods Employed: The color change poliovirus neutralization test which was developed by Dr. Salk and modified by Dr. Rightsel is used.

Major Findings: A rapid efficient, modified color-change test for antibodies to the 3 types of poliovirus has been established in the DBS serology laboratory. This test is used to:

(a) Choose non-immune monkeys for the monkey safety test,
(b) Do antibody determination of monkey sera for the poliovirus vaccine potency test,
(c) Do antibody determination of guinea pig and chick sera for development of an improved vaccine potency test,
(d) Do antibody determination of human sera for the Employee Health Service, and
(e) Do poliovirus antibody determination for various investigations throughout DBS.

Significance to the Institute: An essential service facility for DBS.

Proposed Course of Project: Development of a central facility for the carrying out of serological investigations and for conducting various serological tests, including complement fixation and virus neutralizing antibody determinations in serums, as a service function for accomplishing the control objectives of the Laboratory of Viral Products.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 14
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	26,000	4,000	30,000	1.0	4.0	5.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	4	5	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 14
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 15
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Viral Research Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Respiratory Diseases
PROJECT TITLE

7. Dr. Bernice E. Eddy
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Objectives: The specific objectives of this project are (1) to control and improve influenza virus vaccines, (2) to control adenovirus vaccines, (3) to study other etiological agents responsible for respiratory disease, (4) to control, when necessary, pneumococcus typing sera, and (5) to conduct research relating to these objectives.

Methods Employed: The methods employed consist of animal inoculation, propagation of viruses in animals, embryonated eggs and tissue cultures derived from monkey renal tissue and from other human or animal tissues, differential centrifugation, and serological methods.

Major Findings: The work falls into two categories, A. Control and B. Research.

A. Killed influenza virus vaccines of two formulas have been released. One for military use contains three strains of virus and is similar to the vaccines used for the Armed Forces in the 1955-1956 season. The vaccine for civilian use contains five influenza virus strains and has a different formula from the civilian vaccine used in the 1955-1956 season. It was necessary to choose, evaluate and distribute to the manufacturers a new standard reference influenza virus vaccine for determining the potency of the new formula vaccines.

Tissue cultures used for determining the safety of adenovirus vaccines are checked to determine their sensitivity to known adenovirus strains. This is to insure that small amounts of adenovirus could be recovered in the test cells if the inactivation process used in preparing the vaccine is not complete.

B. Virus strains comprising a live influenza virus vaccine prepared in Russia have been separated from each other and identified, and the antigenicity of the vaccine in animals has been studied.

Material from mice having leukemia or parotid gland tumors was cultured in tissue culture and the fluid from the culture induced neoplasms in newborn mice. This was a collaborative study with a group in another Institute (NCI).

Progress has been made on a potency test for adenovirus vaccines.

Significance to Biologic Standards: The general aim of the project is to fulfill the obligation of controlling and improving influenza virus and adenovirus vaccines and to look ahead to the production and control of vaccines made with the etiological agents of other respiratory diseases.

Proposed Course of Study: It is proposed to continue to study influenza virus strains from outbreaks or epidemics which have occurred or are occurring with a view to the coverage of the present influenza virus vaccines. Influenza virus strains which are recovered from a current outbreak of influenza are often antigenically different from the strains obtained in an earlier outbreak.

of the old influenza virus strains which the influenza virus vaccines used in England and some other countries do not. Only a constant study of strains over a long period of time will solve the problem.

A new influenza virus vaccine for military forces for the next season has been formulated. Negotiations have been started to secure samples of vaccine of this formula from different manufacturers in order to choose and evaluate a vaccine for a reference standard. The preliminary samples will also undergo careful and complete tests for safety since they will have a higher virus content than influenza virus vaccines which have been used heretofor.

A strain of virus which was used to prepare an experimental vaccine for the Armed Forces is being adapted to mice and its characteristics are being studied in the event that it may be incorporated into influenza virus vaccines at a later date.

Influenza virus vaccines prepared with adjuvants are also undergoing study.

Certain Danish strains of pneumococci are being studied in an effort to find out how they compare with the pneumococcic types known in this country.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 15
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	73,700	6,000	79,700	1.0	9.5	10.5

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	11	13	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☒		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 15
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Stewart, S. E., Eddy, B. E., et al. The induction of neoplasms with a substance released from mouse tumors by tissue culture. Virology. In press.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Vice President of the Washington Branch of the Society of American Bacteriologists.

An invitation to give a paper on pneumococcus types at the International Microbiologic Congress in Stockholm, Sweden in August 1958 as a member of the Subcommittee on Streptococci and Pneumococci.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 16
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Virus Research Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. I. Applications of Complement Fixation to Poliomyelitis Vaccine Study.
II. Growth of Vaccinia Virus in Bovine and Simian Cell Cultures; Potentialities of Tissue Culture for Production and Testing of Smallpox Vaccine.
PROJECT TITLE

7. Dr. Joel Warren
PRINCIPAL INVESTIGATOR

8. Dr. J. Donald Hare and Dr. Ernest L. Cutchins.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

I. Applications of Complement Fixation to Poliomyelitis Vaccine Study.

A. The CF Antibody Response to Poliomyelitis Vaccine in Vaccinated Animals.

Objective: The present standard potency test for poliomyelitis vaccine consists of a measurement of neutralizing antibody development in vaccinated monkeys. The large degree of variation observed in monkeys receiving a single lot of vaccine and the variables inherent in the test procedure make it desirable to investigate the titers of CF antibody in this and other species with the hope of finding an additional biologic index of a vaccine's antigenic effectiveness.

Methods: Antigens prepared from concentrated, partially purified poliovirus are tested with pre-and post-vaccination animal sera using a variety of experimental conditions. Antisera against live virus are included for purposes of comparison.

Major Findings: It has been found that following vaccination CF antibodies ranging from 1:4 to 1:32 develop in guinea pigs. These are only demonstrable with concentrated antigens. Monkey sera, on the other hand, manifest little or no CF activity at a time when neutralizing antibody is high. A satisfactory dose-response relation is obtained with vaccinated guinea pigs.

B. The Measurement of CF Antigen in Poliomyelitis Vaccines.

Objective: A single direct measurement permitting continual gauging of the antigen content of poliomyelitis vaccines would be of value in the production and standardization of this biologic.

Methods and Major Findings: Using the methods described in A, it has been observed that commercial vaccine concentrated by ultracentrifugation will fix complement with hyperimmune (convalescent) monkey serum. In preliminary studies vaccine fractions collected at various stages during production runs have contained equal amounts of antigenic material apparently little affected by filtrations or inactivation procedures. When such fractions were tested against a hyperimmune rabbit serum (also containing antibody to monkey kidney) it was found that an interfering factor is present in poliovirus grown in monkey kidney tissue and in vaccine. Concentration of vaccine in the ultracentrifuge and resuspension in salt solution yields an antigen free of this factor and one which elicits earlier and higher antibody levels in guinea pigs than does the parent (crude) vaccine.

Proposed Course: A systematic study of the CF reaction is underway to determine whether this simple technique can be used as a screening procedure and supplementary assay method for poliomyelitis vaccine potency.

Significance: If a simple direct assay method can be developed it will permit screening of various lots for potency during manufacture, better estimation of expiration periods and possibly provide better correlation with immunogenic response in man.

II. Growth of Vaccinia Virus in Bovine and Simian Cell Cultures; Potentialities of Tissue Culture for Production and Testing of Smallpox Vaccine.

Objective: Smallpox vaccine is prepared in calf lymph and standardized by titration in the skin of rabbits. A product manufactured and assayed in a serial line of bovine cells might be safer, cheaper, and easier to standardize.

Method: Serial cultures of calf lung, kidney, and muscle have been maintained for six months and tested for their ability to produce vaccinia virus, their sensitivity to infection, and their stability. Monkey kidney cells are included as a mammalian cell comparison.

Major Findings: Yields of $1x10^{6.5TCID}50$/ml are readily obtained and kidney appears to be the most susceptible bovine cell. However, all strains of vaccinia titer 1-2 log dilutions higher in monkey kidney tissue. Commercial smallpox vaccine titrated in monkey kidney gave TCID50 equal to those in chick embryo or rabbit skin.

Proposed Course: The kinetics of vaccinia multiplication in bovine cells will be studied using "cell-adapted" strains. In addition, further comparison will be made of the tissue culture vs. rabbit and chick embryo methods of assaying commercial smallpox vaccine.

Significance: Serial bovine cells are remarkably hardy and stable and manufacture of smallpox vaccine from this source might provide a cleaner product. Assay in the tissue culture system could replace the present tedious and variable rabbit method.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 16
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	68,000	6,000	74,000	3.0	2.0	5.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	4	4	8	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DBS - 16
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 17
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Section on Biophysics and Biochemistry
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Physical and Chemical Characterization of Animal Viruses
PROJECT TITLE

7. Dr. C. W. Hiatt
PRINCIPAL INVESTIGATOR

8. Dr. Aaron D. Cooper
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

The objective of this project is to obtain fundamental information about the chemical and physical properties of animal viruses in order to contribute to a broad and sound foundation for the control of biological products of viral origin.

The project has been subdivided into the following categories:

1. Physical and Chemical Characterization of the Animal Viruses.

A study of the comparative morphology and composition of a variety of animal viruses, especially those which are pathogenic to mankind and therefore may be used to prepare vaccines or diagnostic antigens. Emphasis will be placed upon the development of techniques which are rapid, widely applicable, and require minimal quantities of virus.

2. The Mechanisms of Viral Inactivation. An investigation of the chemical and physical processes which destroy virulence, antigenicity, or other biological properties of animal viruses. This study will deal not only with the practical aspects related to the manufacture of viral vaccines, but also with the possibility of using inactivation data as a source of information about the constitution and essential functions of the virus particle.

3. Development of Methods for the Chemical Analysis of Viral Products. This activity, to be undertaken as the need arises, will consist in devising new methods, or adapting existing methods for the control of the quality of vaccines and diagnostic antigens.

It is anticipated that the execution of these research tasks will require close support from other units within the Division of Biologics Standards to complete the biological phases of the investigations. Likewise, it is expected that the facilities of this section for physical and chemical analysis will be made available to support other research activities within the Division.

The progress made since August, 1956, when this section became fully organized and occupied its present quarters, has consisted mainly of acquisition of equipment, preparation of reagents, and construction of experimental apparatus. An analytical ultracentrifuge has been acquired and a high-resolution electron microscope has been ordered.

A detailed theoretical analysis of the kinetics of inactivation of poliomyelitis virus with ultraviolet light has been completed and has resulted in theoretical inactivation curves which provide a good fit to the limited amount of experimental data which is available at present.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 17
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	93,000	7,000	100,000	2.25	1.0	3.25

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	4	2	6	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

Because of the nature of the facilities available to this section it cooperates with all components of the DBS.

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 17
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 18
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Research
LABORATORY, BRANCH, OR DEPARTMENT

4. Virus Research Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. A. Studies on Variation in Virulence of Poliovirus.
B. Classification of Simian and Other Viruses.
PROJECT TITLE

7. Dr. C. P. Li
PRINCIPAL INVESTIGATOR

8. Dr. Robert Kramer
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Does not resemble or parallel research done elsewhere in P.H.S. Cooperates with Project No. NIDR-14 McBride and Fullmer.

10. PROJECT DESCRIPTION:

A. Studies on variation in virulence of poliovirus.

Objectives: The object of this project is to study the mechanism of variation in virulence of poliovirus i.e. to find out what are the factors influencing the virulence and how we can stabilize nonvirulent variants, i.e., to prevent reversion into virulent form.

Methods Employed: Tissue Culture methods with trypsinized monkey kidney cells and/or other cell lines such as Human skin cells etc, are being used. Mice have been used in the past and will be used in the future. Monkeys will be used too. These animals are used for testing virulence and are inoculated intraspinally and/or intracerebrally.

Major Findings: The major findings of this project during the past year was that the type III poliovirus, LH strain, could be easily made to lose or gain its virulence by culturing it with different host cells and media. So this virus can serve as a useful tool for this study and both the cell line and medium used for cultivating virus are important factors affecting the virulence.

Significance to Polio and Virus Research: In order to manufacture a safe vaccine, it is important to learn how the virus becomes nonvirulent and remains nonvirulent, and what cell line and medium we must use for cultivation. Although animal virulence may not be the same as a human virulence, it is still possible to learn the factors which would influence the virulence in general.

Proposed Course of Project: The virus (mouse adapted type III and I) is grown in Tissue Culture with different cells in same medium, same cells in different media, different cells in different media, same cells in same medium but cultured under different conditions such as variation in pH temperature, etc.

The project is subdivided as follows:

Studies in variation in virulence of poliovirus.

I. The role of host cell line as a factor affecting the mouse virulence of mouse adapted type III poliovirus.

This study has been completed and is being published in Virology (in press).

II. The effect of the chemical nature of the maintenance medium for the host cell on the mouse virulence of type III poliovirus.

This study has just started.

III. The role of maintenance medium of the host cell on the monkey virulence of type I poliovirus, Mahoney strain.

IV. Isolation, safety testing, potency testing of an attenuated type I poliovirus, (Mahoney strain.)

This study is in progress.

Associated studies:

I. Attempts to adapt the poliovirus to chick embryo tissue culture or other pure cell line tissue culture will be made whenever suitable and hopeful variants are obtained.

II. The type of variation of type III poliovirus observed by us is quite analogous to host-induced modification of bacteriophage. This is the first time that host-induced modification of animal virus was observed. Further studies along such lines may throw new light on the problems of host-virus relationship, particularly regarding pathogenesis.

Plaque isolations of virus propagated under these varied conditions will be used for testing virulence in mice and monkeys.

In order to study critically the effect of host cell on the virus they propagate, virus will be passed in single cells in microdrops. The harvests will be inoculated directly into the appropriate animal for determination of virulence.

III. Studies on contaminants. Contamination of our monkey kidney tissue culture with free living ameba occurred twice. A study of pure culture of ameba in tissue culture without bacteria was completed and a manuscript is in preparation.

Recently, another contaminating agent was found which appeared as rod-like bodies in the nucleus of the monkey kidney cells and seemed to be transmitted from one cell to the other through projections from cell cytoplasm. A study of this unknown agent is in progress.

B. Classification of Simian and other Viruses.

Objectives: The chief object of this project is to classify a limited number of the simian viruses by their cytopathogenic effect on different cell lines such as monkey kidney cells, HeLa cells, rabbit kidney cells, beef kidney cells, chick embryo cells, etc. Effort is being made to see whether there is any relationship between such cytopathogenicity and serology i.e. neutralization test and possible, also, complement fixation test.

Methods Employed: Tissue culture method is the principle tool for the cytopathogenicity test and neutralization test. Mice are being used for pathogenicity test. Rodents and/or chickens are being used for preparing immune serum. These viruses will also be inoculated into animals to test their pathogenicity.

Major Findings: During the past year it was found that trypsinized chick embryo tissue culture was a very useful tool to differentiate poliovirus from B virus and certain other simian virus isolated from monkey kidney tissue culture as the former should not cause cytopathogenicity while the latter would. Recent work indicated that the beef kidney cells and other cells may also have differential value. On the basis of the cell line susceptibility, the viruses studied can be divided into two distinct groups. Some of them could not be transferred consecutively in many of the cell lines for more than one passage. This may have been due to host-induced modification, further investigation of which may throw new light on the problem of classification of simian viruses. Regarding intraspinal inoculation of mice, at least, one of them was pathogenic.

Proposed Course: This project will be a continuing one as new agents are continuously being encountered in the course of tissue culture testing.

Significance: This project has special significance for the control program of the D.B.S. since the virulence of virus strains and the encounter of adventitious agents in tissue culture testing are a continuing problem.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 18
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	102,000	8,000	110,000	2.0	11.0	13.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	2	11	13	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DBS - 18
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

C. P. Li and W. G. Jahnes, - Studies on Variation in Virulence of Poliomyelitis Virus.

I. The loss and gain of Virulence of the Mouse Adapted Type III Virus. Virology. In press.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DBS - 19
SERIAL NUMBER

2. Division of Biologics Standards
INSTITUTE OR DIVISION

3. Laboratory of Viral Products
LABORATORY, BRANCH, OR DEPARTMENT

4. Research Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Study of Measles Virus and Its Transmission to Experimental Animals
PROJECT TITLE

7. Dr. Miklos N. Dreguss
PRINCIPAL INVESTIGATOR

8. None
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Objectives: The objective of this research project is to develop serologic tests, by the use of measles virus cultivated in tissue culture, for measuring *in vitro* the antigenicity of such virus. Logically, this should be supplemented and correlated with a study of antigenicity in experimental animals and, eventually, in human subjects.

Methods: The tissue culture method of Enders and Peebles has been used for growing the virus, mainly by utilizing cell lines of human origin. Among serologic tests virus neutralization, complement fixation, hemagglutination and, finally, metabolic inhibition tests have been selected for study.

Findings: Work accomplished so far, in the second half of the year, has been centered on studies of various cell types, both in primary culture and in continuous cell lines in order to find the best fitted method for growing the virus. By using a laboratory strain of measles virus, it was found that primary cultures of monkey kidney cells readily support the growth of the virus. However, the "foamy agents" frequently encountered in such monkey kidney tissue caused much difficulty both in differentiating the cytopathic changes from that of the measles virus, and also in keeping out or removing these wild agents from the culture. Promising results have been obtained in continuous lines of HeLa cells, and the titer of the virus was enhanced by certain experimental arrangements of the subcultures. Hemagglutination has been studied for two months with red blood cells of various species. None of them was found to give a direct hemagglutination, but suggestive results were recorded after modification of the cells.

Significance to DBS: The objectives, as outlined above, represent the necessary steps in a logical approach for developing control methods to be applied in the event that a tissue culture measles vaccine is forthcoming. Aside from this, methods to estimate the measles antibody content of human convalescent serum, and that of the gamma-globulin preparations would be desirable.

Proposed course: It is proposed to extend the work on various human epithelial cells, particularly those that may be subcultured in continuous lines. The relative virulence of the virus in these cells will be studied closely. Parallel studies of the serologic methods will be undertaken. Attempts at transmission of the tissue culture virus to laboratory animals will follow in the second phase of the study.

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INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DBS - 19
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	14,000	1,000	15,000	1.0	1.0	2.0

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	1	1	2	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☒
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

None

Form No. ORP-1
October 1956

Calendar Year 1956

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16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

DIVISION

OF

RESEARCH

GRANTS

ANNUAL REPORT OF ACTIVITIES
Division of Research Grants

Calendar Year 1956

Summary Statement of Extramural Program

The Division of Research Grants is concerned with the activation and support of extramural research, research training, and health research facilities construction programs. It is the central administrative organization that provides the scientific evaluation of applications for research grants and fellowships for the various Public Health Service sponsors, and for its own research and fellowships program not encompassed by these other sponsors' programs. The Division also conducts the fiscal control and audit of the funds expended on the entire program. The areas of research grant and fellowship support directly provided by the Division are those not of immediate interest to the categorical Institutes and other Divisions of the Public Health Service.

A direct reflection of the growing importance of the entire research grants and fellowships program is seen in a comparison of budgets passed by the Congress for the fiscal years 1956 and 1957. Research grants funds were increased from a total of $38.8 million to $89 million, and research fellowships and training were increased from $17.3 million to $33 million. Funds available to the Division's program were increased from $5 million to $8 million for research grants and from $250,000 to $1 million for research fellowships. In addition, the Health Research Facilities Construction Act of 1956 (Public Law 835) established a new construction grants program for fiscal year 1957, and $30 million to implement this program were appropriated in the closing hours of the 84th Congress. The law established a National Advisory Council for Health Research Facilities, and the Division expedited administration of the law and the Council's reviewing procedure by establishing in August of 1956 a new branch in the Division, the Health Research Facilities Branch. The operation of technically reviewing research construction grant applications is accomplished through the use of subcommittees of the National Advisory Council for Health Research Facilities, rather than through Study Sections as utilized in the Research Grants Branch.

One activity which has grown appreciably during the past year is that of establishing better liaison with certain other governmental and quasi-governmental agencies whose research programs correlate with, or complement, the medical and public health research programs of the National Institutes of Health. These agencies include the Bureaus of State Services and Medical Services of the Public Health Service, the Office of Research Services of the Department of Agriculture, the Office of Naval Research, the Food and Drug Administration, the National Science Foundation, and the National Academy of Sciences-National Research Council.

Research Grants Branch

As the entire research program of the Public Health Service has expanded, critical research areas not covered by the categorical interests of the organizational components of the Service have continued to come to light. Traditionally, such areas are sponsored by this Division, through the medium of the Research Grants Branch until they attain an identity with some categorical program. Also, where a research area is of nearly equal interest to two or more categorical programs it has been the practice, in the interests of a unified approach, for the Division to provide the support for such an area. The Division provides a focus for the research disciplines involved in the categorical programs, thus expediting ease of communication between research workers in the various disciplines and providing a central point of reference for the categorical interests in determining disciplinary needs in their respective health areas. Certain of these special areas of research interest are here discussed.

I. Special Areas of Research Interest

A. Research in Experimental Pathology

The Pathology Study Section has long been interested in the development of research potential in pathology. In pursuit of this interest, in January 1954 the Study Section sponsored a conference in Washington on the development of research potential in pathology, leading to the formation of an intersociety committee; set up an *ad hoc* Committee on Increasing Research Potential in Pathology, and made recommendations to the National Advisory Health Council and to the Surgeon General toward development of research in the various areas of pathology.

1. Intersociety Committee on Increasing Research Potential in Pathology: At the conference in Washington already referred to, an Intersociety Committee to Increase Research Potential in Pathology was set up. The Committee, consisting of one representative from each of the five national societies of pathologists and containing Study Section members in its make-up, has addressed itself to study and development of (1) the use of motion picture films useful for training and promotional purposes in experimental pathology; (2) the development of a handbook of experimental methods in pathology and (3) a survey of the overall needs in pathology in its several aspects -- teaching, research and hospital-service.

There is a close working arrangement between the Intersociety Committee and the Study Section.

2. The Ad Hoc Committee on Increasing Research Potential in Pathology: This Committee of the Study Section is drawn from the current and former membership of the Study Section. It has solicited comments from several authoritative sources on means for increasing research potential. From these comments the Study Section has found it

advisable to address two memoranda of recommendation to the various National Advisory Councils. The substance of these recommendations is included later in this report.

3. Cellular and Molecular Pathology: The Study Section has given attention to five important needs: the need for research in cellular and molecular pathology, nutritional pathology, comparative pathology, and geographic pathology, and the need for development of workshops in the experimental methods of pathologic research.

Through a committee, the Study Section is now arranging a conference on cellular and molecular pathology. The purpose is to bring to the attention of pathologists the newer techniques in these fields. The conference will consider the possibilities of the electron microscope for routine use in study and assessment of tissue morphology and function. It is expected to consider reversible alterations in cell organization and molecular pattern of cells, and the ultrastructural or molecular basis for such alteration. Pathology is no longer limited to cells and tissues; a new era, that of molecular pathology, is opening up. The expanding knowledge in many disciplines concerned with ultrastructure should be made known to pathologists not at present oriented in this area.

4. Nutritional Pathology: Nutritional pathology is a broad area requiring research along both experimental and epidemiologic lines This area will have the attention of another conference planned by the Study Section. In view of the shortage of research personnel with training both in nutrition and pathology, the conference will seek ways and means of a "happy marriage" of the two disciplines in the training of research personnel. Pathological lesions of nutritional origin have been produced experimentally by investigators in nutrition, but these lesions have often not been subjected to pathological study because of shortage of histopathologists interest in such research. On the other hand, the pathologist who may be interested in working with nutritionally induced lesions finds himself inadequately oriented in the field of nutrition. Team work is needed. Problems in pure vitamin deficiencies, multiple vitamin deficiencies, coexisting nutritional deficiencies and hormonal alterations and trace element problems need to be attacked by team approach. Nutritional pathology problems likewise carry over into problems known as geographical problems.

5. Geographic Pathology: Geographic pathology is an area of increasing interest. There have been two symposia on this subject (1950 and 1953) supported by the Committee on Geographic Pathology of the International Union Against Cancer. In addition, there have been three recent meetings of the Committee on Geographic Pathology, held in Africa. The last one, in Dakar, concerned itself with the problem of liver cancer in African natives. The problem is one that is closely associated with local dietaries, food habits, genetics, infections, and perhaps even local soil and fauna. In addition, there are problems relative to heart

disease that exist in Africa. The Study Section is considering ways in which it could help the established groups interested in this broad area of geographic pathology and demography and anticipates that it will be guided in this regard through advice elicited from Dr. Paul E. Steiner, Dr. Harold L. Stewart, Dr. W. Stanley Hartroft, Dr. A. Cantarow and other members of a group that visited Africa in 1956, as well as the information available from Dr. Frank Townsend (AFIP) and Dr. Richard Follis. In addition, the Pathology Study Section anticipates cooperating with the Pan American Sanitary Bureau and the National Heart Institute on plans for the development of worldwide guidelines on the nomenclature for atherosclerotic lesions.

6. Workshops in Experimental Pathology: Workshops in experimental pathology are being developed in various teaching centers. The Study Section has urged several groups to develop training courses in experimental pathology. Some preliminary discussions on this subject have been held with Dr. Furth, Dr. Breedis, Dr. Moon and Dr. Davidsohn on experimental techniques, comparative pathology, and immunohematology. In addition, the Study Section and the Intersociety Committee are developing a manual of experimental methods.

7. Graduate Research Training Grants: The Study Section has alerted various academic centers on the availability of graduate research training grant support in the cardiovascular and cancer areas. Seven such graduate training grants have been approved by the Study Section and Council of the Heart Institute and five additional ones are up for review. In addition, there were two grants that were reviewed by the Cancer Council, of which one was approved and one will be re-reviewed after an initial deferral. These training grants are for the expressed purpose of developing career investigators who will act as future academic leaders in developing research programs in experimental pathology.

8. Definition of Experimental Pathology: Throughout this discussion there has been no attempt to define either research or experimental pathology. To be considered properly as "experimental pathology", a project should include two aspects: (1) An experiment must be set up to prove or disprove a hypothesis, elicit new information, or corroborate old information; (2) It must include some aspect of morphology of disease using the time-tested histochemistry and electron microscopy. Preferably, it should also include the techniques, skills, or knowledge of another discipline, for example: physiology, endocrinology, etc., and require an intimate knowledge of the structural alterations in the disease processes being studied.

9. Pathology in Public Health Hospitals: The Study Section is available for advice, if such should be sought, on the development of research in the hospitals of the Public Health Service. The Study Section believes that only with a strong Pathology Department will the intents of the Hill Report be met. (The Hill Report in 1956 included a reference to the need for research in Public Health Service hospitals in order to bring these hospitals to a high academic stature.) The Study Section is

also interested in the development of training programs in neuropathology, and plans to discuss this problem with the appropriate training groups.

10. First Study Section Memorandum to Councils: Reference has been made to two memoranda of recommendation addressed to the several National Advisory Councils by the Pathology Study Section. The first of these, dated September 10, 1956, was devoted to setting forth the need for additional funds for training-in-research in pathology. In this, the fifteen scientists composing the Study Section gave endorsement to the recently increased research-training grant program; recommended that the program be given expanded financial support and urged that it be extended to include research training in the basic disciplines, including pathology.

The advantages of this type of grant as pointed out by these scientists are (1) that it permits prompt selection of the trainee by local scientists; (2) that the long term support provided is beneficial to the trainee, his colleagues and to the research to be undertaken; (3) that the conditions of the grant as set up permit needed flexibility in adjustment of stipends and responsibilities to local conditions; and (4) that the load of administrative work is less for funds expended under this type of grant.

The memorandum pointed to the need for research men in pathology who have a broad background in the basic medical sciences and clinical medicine. Expansion of the training grants program as recommended should make it possible to give research training to men with such backgrounds who are not now active in research; to turn into research channels the interests of men now training for careers in pathology, and to attract younger men of creative promise into such research careers.

Research in pathology should draw upon related disciplines for modern techniques applicable to further exploration into biological-functional areas.

The memorandum recommended that $500,000 for the calendar year be made available for research training grants in pathology and that a doubling of this amount be considered for yearly support thereafter.

11. Second Study Section Memorandum to Councils: The second memorandum, dated October 10, 1956, was devoted to the needs for future research development in pathology. Four research areas were selected for attention at this time: (1) nutritional, (2) comparative, (3) geographic and (4) cellular and molecular pathology.

The members of the Study Section see a need of $100,000 to $300,000 additional support annually for research and research training in nutritional pathology and $50,000 to $150,000 annually for the next three years for comparative pathology.

Cellular and molecular biology, the memorandum points out, is not a sharply defined area, but involves the interrelationships of function, structure, chemistry and physics at the cellular and molecular level. One aspect of this complex is cellular and molecular pathology. The pathologist with his background in the biology of disease must assume his research responsibility in this area. Several hundred thousand dollars of research support annually are needed to permit him to do so.

The Study Section members deferred making any estimate of funds needed in the area of geographic pathology. This area calls for investigators trained in both epidemiology and pathology.

The memorandum mentions as desirable: courses in biopathology, special summer courses for teachers of experimental pathology and of comparative pathology, and training programs or short courses in techniques and methods -- e.g., electron microscopy, histochemistry and immunopathology.

B. Research in Diseases and Impairments of Genetic, Gestational and Birth Origin

The field of human congenital anomalies (including functional impairments and disease) is another area which is in need of more extensive research.

The progress made since the turn of the century in the control of the infectious diseases of infancy and childhood has so reduced the death rate from these diseases that deaths from congenital malformations and other prenatal impairments are now thrown into sharp relief. It is appropriate, therefore, to subject the problems in this area to detailed examination.

1. Prenatal Causes of Infant Mortality: There is increasing recognition of the fact that prenatal factors play an important role in many diseases and disorders of postnatal life. A generation ago infant mortality was dominated by nutritional and infectious diseases of postnatal origin. Malnutrition, rickets, enteritis, diphtheria, scarlet fever, epidemic meningitis, syphilis and tuberculosis represented some of the problems encountered. After it was learned how to prevent or treat these diseases, a series of disorders came to the fore that have their roots in prenatal life and are not at present subject to control. Congenital malformations represent the most conspicuous sector of this large area of prenatal pathology. To illustrate this change in infant mortality, it is worth comparing, over a period of years, the annual percentage of deaths under one year from enteritis with the annual percentage of deaths from congenital malformations (U.S. Vital Statistics). While deaths from enteritis have shown a steady decrease, percentage wise, those from malformations have shown a steady increase. Congenital malformations now account for 14 percent of infant deaths in the United States. In New Zealand, which has a lower overall infant mortality rate, congenital malformations now account for one-fifth of the deaths under one year of age.

Statistics show not only a relative but also an absolute increase in deaths from congenital malformations. Whether this increase is real or is only apparent, due to improvement in diagnosis and registration of vital data, cannot at this time be determined. We know that in the past many children died with such diagnoses as pneumonia, gastroenteritis or nephritis, where now the deaths would be attributed to defects of prenatal origin. It is possible, however, that there are additional factors, not previously recognized or even present, which have now become responsible for the increased incidence of congenital malformations.

2. Prenatal Factors in the Etiology of Chronic Disease: Medical diagnostic procedures not infrequently reveal internal malformations which are unrecognized until illness necessitates special examination. Since illness or death from malformations may occur at any time of life, congenital malformation may escape identification as the cause, In medical practice the diagnosis may name a condition that is secondary to a malformation and may overlook its teratologic cause.

In a study of 6000 pregnancies (McIntosh, Columbia University, RG-4194) congenital malformations were found in 21 percent of infants dying during the perinatal period and in 7 percent of the live-born infants surviving to age 28 days or older. In the surviving children (to age 1 year) less than half of the malformations ultimately recognized were suspected at birth. Many congenital malformations have significance only as points of reduced resistance, causing disease only when postnatal pathogenic factors become active. A deformity of the ureter or a congenital structure anomaly of bone may be converted thus into disease by infection or trauma. In such cases it is sometimes difficult to evaluate the importance of prenatal and postnatal factors.

Prenatal impairments, including congenital malformations, are responsible for many chronic disorders of childhood. According to Shands (Alfred I. duPont Institute of DeNemours Foundation), 30 percent of the orthopedic deformities, 38-58 percent of the heart disease in school children, 61 percent of deafness, and 58 percent of blindness in children are due to congenital impairments. It is frequently overlooked that many endocrine disorders are due to congenital anomalies of the glands or of surrounding structures. In a study of the neuropathology of over 500 autopsies of mental defectives, 74 percent of the brains examined were congenitally deformed. It now seems certain that congenital anomalies, macroscopic, microscopic, or chemical, are responsible for a large area of the chronic disability of childhood.

3. Genetic and Environmental Factors: Prenatal influences are most conspicuous in families showing transmission of congenital anomalies or diseases through many generations. Long before the rise of modern genetics it was recognized that both normal and abnormal traits are passed on from parents to children. Soon after the rediscovery of the Mendelian laws, it was shown that brachydactyly was inherited in a

Pennsylvania family as a dominant Mendelian trait. Then followed several decades in which many congenital anomalies were explained on a genetic basis. Indeed, about 20 years ago, many geneticists thought that almost all pathological processes in prenatal life were caused by abnormal genes.

Today we know that congenital malformations are certainly not uniformly hereditary. There exists a wealth of evidence that they can be induced by various environmental factors. In areas where endemic goiter is prevalent, there also exists a condition called endemic creginism. Endemic cretins are always children of goiterous mothers. They are dwarfs, mentally deficient, and myxedematous. Thyroid medication does not help their mental status since their brains have been damaged before birth. A mother who has had an endemic cretin can subsequently have a normal child, however. Although the etiology of this condition is not entirely clear, there is general agreement that it is closely related to the environment. This fact illustrates that familial occurrence of a congenital disorder does not necessarily prove genetic inheritance.

Experiments on laboratory animals have shown that nutritional factors can cause congenital anomalies. Prenatal infections, such as rubella or toxoplasma have been found to cause congenital anomalies in man. There is some evidence that even subclinical infections may occasionally cause malformations. It is also well known that stress or trauma to the mother, at any time from the earliest stages of pregnancy to the time of final delivery, may alter adversely the environment of the fetus sufficiently to cause anomalies. Furthermore, any one of a variety of insults can produce the same type of malformation, and a given type of insult can result in any one of a variety of malformations. It seems probable that not only the degree and type of insult, but also the timing and duration are important.

4. More Basic Research Needed: It is a peculiarity of congenital malformations that they may be multiple rather than confined within the borders of any one anatomical structure. In order to obtain suitable medical treatment in the syndrome of arachnodactyly, for example, the patient needs the help of a pediatrician, orthopedic surgeon, ophthalmologist, cardiologist, lung specialist, gastroenterologist, and an endocrinologist. Many syndromes of this nature have been identified, and discovery of others is to be expected.

In recent years good results in the repair of many congenital anomalies have been obtained by surgical measures, but prevention and not repair must be the aim for the future. Rational preventive measures require knowledge of the causes of congenital anomalies. These are still obscure in most instances. To arrive at a better understanding of these causes and their control, much more basic knowledge is needed. There is definite need to stimulate investigations in the fields of genetics, embryology, and prenatal physiology and pathology and to apply statistical, epidemiological, and other methods in order to fill in the gap areas in our knowledge of the normal processes of development.

Only through better understanding of normal developmental phenomena can there be an understanding of departures from the normal.

5. Noncategorical Interests: Congenital anomalies and birth injuries touch every organ system. As has been pointed out, multiple deformities in the same individual, either anatomical, physiological or biochemical, are a common finding.

According to McIntosh (Pediatrics 14, 505, 1954) the musculoskeletal and central nervous systems are equally represented among anomalies found in stillborn infants, with cardiovascular anomalies a close third. Among infants dying in the first four weeks after birth, genitourinary anomalies come first, with the cardiovascular, musculoskeletal and gastrointestinal systems following in close order. Among infants surviving to age 28 days and on to 1 year or older, musculoskeletal anomalies exist in greatest numbers, followed next by those affecting the skin, and with those affecting the central nervous system occupying third place.

The research area of diseases and impairments due to genetic, gestational and birth influences is seen, therefore, to be a broad area extending far beyond the limits of any one of the categorical constellations of disease conditions. As has been pointed out, the basic research needed is in the fields of genetics, reproductive physiology and pathology (including prenatal nutrition), embryology, and in the entire extent of prenatal physiology and pathology. In programming for etiologic research in this field, a broad approach is necessary rather than research limited strictly along lines of established medical specialties.

6. Activities in the Field of Congenital Malformation: Many investigators interested in studying the mechanisms of congenital malformations have directed their attention to experimental production of these malformations. A great deal of such work was done in the past in the lower classes of animals (invertebrates). In recent years such experiments have been extended successfully to mammals. Teratology, the science of congenital malformations, is no longer limited to congenital monstrosities but deals also with minor defects resulting in disease and functional disturbance.

In a symposium sponsored jointly by the Human Embryology and Development Study Section of the National Institutes of Health and the Association for the Aid of Crippled Children, held in Cincinnati in January 1956, investigators interested in the field of congenital malformations gathered to present their research findings and to exchange ideas. The papers presented at that meeting will be published in the journal, Pediatrics. A second symposium, under the same sponsorship will be held April 15-16, 1957, in Bethesda, Maryland.

7. Progress of Some Active Grants: A variety of research projects on which progress was reported during the last year are summarized briefly below. They have to do with (a) basic studies on the placenta, (b) basic studies of other reproductive organs, (c) studies of pregnancy and (d) studies of pregnancy wastage. Their non-categorical nature is apparent.

a. Basic Studies of the Placenta

(1) George B. Wislocki (deceased); Helen A. Padykula (Chief Investigator) RG-3298(C5) Problems of gestation and placentation investigated by histochemical methods and electron microscopy. Work accomplished:

The placental barrier in the rat, examined at 15, 17 and 21 days of gestation was found to consist of (1) two or three thin, overlapping sheets of cytoplasm of individual trophoblastic cells; (2) a basement membrane supporting the trophoblast, and (3) the wall of a fetal capillary which is made up of a basement membrane bearing a lining of endothelial cells. Thus the placental barrier is not hemoendothelial, as was previously assumed, but hemochorial and the trophoblast is cellular instead of syncytial.

In the human being, examined at 10 weeks and at full term, the placental barrier consisted of (1) a layer of syncytium bearing microvilli, (2) a basement membrane, (3) a connective tissue space containing collagen fibrils and (4) the wall of a capillary made up of a basement membrane lined internally by endothelium. The importance of this work lies in establishing fundamental facts about the morphology of the placenta and in clearing up some misconceptions regarding the cellular barrier mediating and regulating placental exchange.

(2) Howard H. Hillemann. RG-3775(C4) Morphogenesis of the placenta of primates.

An attempt is being made to breed South American pygmy marmosets (primates) in captivity for dated placentae. Histological, histochemical, and electron microscopy studies of the placenta of the baboon, also of the nutria and chinchilla, are under way. The semen of the chinchilla was studied for volume, sperm density and total sperm count. The placenta of the chinchilla was studied to determine the maternal and fetal vascular patterns.

(3) Joseph Dancis RG-4024(C2) Physiology of the placenta. A method was developed for the perfusion of the freshly delivered human placenta. It was demonstrated that the placenta has the capacity to convert C^{14}-labeled acetate to estradiol and the perfusate is capable of interconverting estradiol and estrone.

b. Basic Studies of Other Reproductive Organs

(1) Gertrude J. Van Eck RG-3966(C6) Ovogenesis in the rhesus monkey (Macaca mullata). Influence of external factors.

The problem of postnatal ovogenesis was approached by analyzing the number of ova and atretic ova in the rhesus monkey. The number of ovocytes varies widely in different animals of similar ages. The right and left ovaries of one monkey contained about equal numbers of ovocytes. The distribution in the different stages of follicle development was constant. The percentage of atretic ova was also constant for each group. The average life of the ovocytes was about 6 months, the maximum life about 2 years, and the average time for the growth of the mature follicle from the large primary follicle was 4 to 6 weeks.

(2) S. A. Asdell RG-4207(C2) The hormone control of the oviduct.

The rabbit was selected for this study because the amplitude and regularity of spontaneous longitudinal contractions of the oviduct are much more evident than in other species tested. In the rabbit with Graafian follicles, oviduct contractions are strong; in those with corpora lutea, weak; in the ovariectomized they are almost nonexistent. Estrogen restores contractility in the ovariectomized animal; progesterone does not. Nuclei are extruded from epithelial cells in the ovariectomized rabbit; estrogen tends to prevent this. Protrusion of cytoplasm is characteristic of progesterone-treated ovariectomized rabbits.

(3) Albert A. Plentl RG-3354(C4) Isotope tracer studies on the origin and fate of the amniotic fluid.

These findings are of importance to problems of sodium and water metabolism during normal and abnormal pregnancies and to electrolyte transfer to and from the amniotic fluid.

A comparison of sodium space and total exchangeable sodium of pre-eclamptic patients and normal pregnant women at term revealed no statistically significant difference between the two. It was shown that 25-50 percent, and possibly 75 percent, of water exchange takes place through the intermedium of the fetus.

The most outstanding difference between normal and hydramniotic patients was in a reduction of the water exchange between mother and fetus. It is believed that an embarrassment of the fetoplacental circulation represents an important, if not primary, etiologic factor in this disease.

(4) C. Frederick Fluhmann RG-4034(C2) Response of endocrine and other glands to drugs and hormones.

Daily injections of Rauwolfia serpentina into young rats resulted in a marked decrease in the weights of the anterior hypophysis and the thyroid gland.

(5) Alfred J. Weil RG-4283(C2) Immunological properties of spermal fluid and spermatozoa.

It was shown that human spermal fluid is highly antigenic. Studies are now in progress which are designed to investigate the possibility that an antigen-antibody reaction may exist between spermal fluid and spermatozoa or between these and other body fluids. Presumably such a reaction could affect male fertility.

c. Studies of Pregnancy

(1) Franklin F. Snyder RG-2000(C6) Action of drugs in obstetric analgesia, especially opiate antagonists.

This study consists of testing of drugs on rabbits and rabbit fetuses, especially for their action on intrauterine fetal respiration, on the expulsive mechanism, and on the labor mechanism. Dr. Snyder has made valuable contributions on the effects of various pain-killing drugs in obstetrics. Depression of respiration in the infant after administration of morphine to the mother is relieved when allylmorphine is also given.

(2) Ethan A. H. Sims RG-3745(C3) Serial renal function studies during normal and toxemic pregnancy.

Important findings are:

(a) Effective renal plasma flow and glomerular filtration rate increases significantly during the 12-36 weeks of pregnancy.

(b) Toward the end of pregnancy, as the effective renal plasma flow falls toward the normal range, the filtration fraction rises so that the glomerular filtration rate remains proportionately more elevated.

(c) During at least the first 16 weeks postpartum, the effective renal plasma flow and glomerular filtration rate are below the normal range.

Present studies include:

(a) Determination whether variation in renal function occurs in normal subjects in relation to the menstrual cycle.

(b) Investigation of the mechanism of glycosuria during pregnancy in the normal and in the diabetic subject.

(3) Morris Smithberg RG-3859(C3) Environmental influences upon morphogenesis in the mouse.

This work concerns the significance of embryological developmental variations in presumably homozygous populations as brought about by environmental influences.

The environmental influences studied included folic acid and riboflavin deficiency, insulin, and fasting. Evidence was presented that folic acid and carbohydrate fit a biochemical model of coenzyme and substrate. Deformed embryos result if either coenzyme or substrate is temporarily removed. Removal of both has no more effect than removal of either one. Certain substrate substitutions can be made.

In addition, study was made of the hormonal requirements for pregnancy. Ovulation and mating were successfully produced in prepuberal mice. After conception in such animals it was found possible, even after ovariectomy, to bring about implantation, maintain pregnancy, cause parturition and to have lactation and normal rearing of offspring.

(4) J. B. Thiersch RG-4385(C) The effect of antimetabolites on reproduction.

Compounds, especially those with action on tumors, were tested on the pregnant rat to study their effect on implantation, decidua formation, corpus luteum, placenta and fetus. It is expected that the results of the tests will indicate:

(a) Fetal requirements for certain metabolites previously not known;
(b) Danger of use of antimetabolites in chemotherapy of pregnant women;
(c) Possibility of finding antimetabolites which permit the control of reproduction in man when pregnancies are undesirable.

Thus far, 2 out of 9 compounds tested and analyzed were found to destroy fetuses when administered to pregnant rats from time of implantation to midterm of pregnancy. These investigations suggested that the period in the life of the rat fetus when it is most sensitive to antimetabolites is at and immediately following implantation.

d. Studies of Pregnancy Wastage

(1) Edith L. Potter RG-3166(C5) Investigation of special causes of fetal and neonatal deaths.

Data are being collected on about 3,500 births annually at the Chicago Lying-In Hospital. Data concern prenatal state of mother, labor, delivery and clinical course of infant after birth. Comparisons are made between conditions occurring in women giving birth to surviving children and in those whose infants do not survive.

About 400 autopsies are performed annually on fetuses and newborn infants. These provide material for:

(a) Calculation of frequency of causes of death,
(b) Study of rare or unidentified conditions,
(c) Study of clinical entities (polycystic kidney, erythroblastosis fetalis, hyaline membrane disease),
(d) Study of histologic differentiation of organs during fetal life.

Hematologic studies (on types of incompatibilities) are being made on living infants.

Histochemical studies are being made to determine:

(a) Amount of fat in liver in nonsurviving (from postpartum starvation; infection) infants.
(b) Correlation of hepatic glycogen with anoxia; presence of fat; duration of survival.
(c) Correlation of changes in maternal renal biopsies with clinical form of toxemia and with outcome of pregnancy.

Studies are designed to reduce "pregnancy wastage" in general.

(2) William A. Silverman RG-4277 Standard mortality rates for premature nurseries.

At the conclusion of the study specific death rates will be computed and published as a set of Standard Mortality Rates.

(3) Rustin McIntosh RG-4194(C3) The role of prenatal influences in fetal development.

This is a long-term study of the pathology of human reproduction in order to determine the incidence of abortion, stillbirth, prematurity, and congenital malformation in an unselected population, and to delineate etiologic factors.

In addition, it is planned to correlate the normal variations of pregnancy with the physical status of the newborn infant. These data are expected to reveal some normal variations in infant development at birth, six months and one year.

While these studies are involving collection of data on a long-term basis, other projects have been completed. These include:

(a) A study of the normal variation in acetabular angles at successive periods in infancy;
(b) A description of newly recognized diagnostic changes in the pelvic bones in Mongolism;
(c) Observations on the ossification of the pubic bones at birth.

C. Research in Biophysics

Biophysics has been defined as the application of the physical and mathematical way of thinking to biological problems. It is concerned, for example, with (1) reduction of life processes and activities to physical principles; (2) use of energy by the cell machinery; (3) intimate structure (shape, size and composition) of complex molecules such as nucleoproteins; and (4) physico-chemical studies of gene, virus, muscle, nerve, and whole organ and body structure and function.

1. Difficulties in Recruiting Interest: Certain difficulties have been encountered in attempts to arouse interest in the field; they may be summarized as follows:

a. High school and college students are reluctant to tackle the "difficult" subjects -- physics and mathematics -- necessary for a career in biophysics.

b. Mathematicians and physicists are generally not interested in biological and medical problems.

c. Biophysics means different things to different people. The lack of a clear delimitation of the field makes it difficult to establish college and university departments offering graduate training in this field.

d. The high cost of the complicated instruments needed for graduate training in biophysics is a further impediment to the establishment of graduate departments.

e. Before individuals with a B.S. degree in physics can get into graduate work in biophysics, they are attracted into industry by high salaries.

f. For these several reasons, at least in part, the placement of recent Ph.D.'s in biophysics also creates a problem.

2. Progress Made: A certain amount of progress has been made during the past year, in spite of these difficulties. Three regional conferences were sponsored by the Biophysics and Biophysical Chemistry Study Section with encouraging results. Dr. Paul Klopsteg, as Associate Director of the National Science Foundation, has made a study of the most productive ways of providing training in the theory and use of the complicated instruments now employed in medical research and has studied the feasibility of establishing new national, regional, or university centers of instrumentation. Dr. Richard Bolt, Head of the Acoustics Laboratory at the Massachusetts Institute of Technology, will spend essentially full time as special consultant to the Study Section to help in developing biophysical and biophysical-chemical research in schools of particular promise.

3. Recommendations to Councils: In addition to these efforts the Study Section has made the following suggestions to the National Advisory Councils which consider research grants involving biophysics:

a. Provide broad and generous support to a few outstanding departments in this scientific area.

b. Provide money for support of investigators or future investigators at every level from college seniors to full professors.

c. Sponsor interdisciplinary "work-shops" to explore and discuss scientific problems: for example, what are some of the unifying fundamental physical principles which underlie biological processes.

d. Hold conferences between outstanding physicists and biologists at which the physicist may be introduced to the stimulating challenge presented by the cell.

e. Establish instrumentation training centers.

f. Determine the feasibility of creating a new center of modern biology patterned after the Marine Biological Laboratory at Woods Hole, Massachusetts.

g. Provide means of exchanging ideas and men at all levels, from departmental up to international.

D. Research in Toxicology

In the brief period since World War II our total environment has been altered to a very large degree. In some areas certain of these alterations are obvious and sometimes discomforting, but a far larger share of these are subtle and relatively unnoticed. One of these unnoticed changes is the appearance in our food and drink of one or more of some 200 substances having no known nutrient value but added, nevertheless, either adventitiously or intentionally.

1. Adventitious and Intentional Additives: Chief among the adventitious additives are the residues of pesticides that must be used on growing crops and on unprocessed food in storage. The intentional additives include food preservatives, emulsifiers, antioxidants and other conditioners. whose use is equally necessary.

Most significant is the fact that neither the individual nor the public has any choice about ingesting these materials; their presence has become an inescapable part of the environment. As one example, water supplies are contaminated with chemicals by the natural run-off from farms where insecticides have been used extensively. So far, the presumption has prevailed that neither the adventitious nor the intentional food additives are consumed in sufficient quantities per capita to cause any alarm as to the possible ill effects of any one or more of them. Many experts feel that this presumption should be given further rigorous test.

2. Further Study of Toxicity Needed: The need for careful examination of the possibility that there may be ill effects from the intake of these chemicals in small amounts over long periods of time was brought into focus by the testimony of many experts, including the then Surgeon General* of the Public Health Service, before a committee of the 81st Congress. Dr. Scheele, who gave testimony, pointed out that there is inadequate information on the chronic effects of chemical substances currently in use and that the problem was increasing in magnitude with the yearly introduction of new compounds for use in food production, processing, packaging and distribution.

The necessity for the use of super-toxics to destroy, prevent, repel, or mitigate the activities of insects, weeds, fungi, nematodes, rodents, and bacteria is revealed in Department of Agriculture figures which show that these destructive organisms cost 4.8 billion dollars in damage to crops in one year (1954) alone.

In the development of new pesticides, it is estimated that only one compound in 2000 becomes commercially acceptable. The total cost to industry to examine all of these and bring the best one to an acceptable stage may reach as high as two billion dollars. A substantial part of this cost is the evaluation of the toxic effects on the animal or plant pest, then on the laboratory animals and man.

To protect the user and to ensure safe food for the consumer, criteria for handling and use must be met. In conformance with the Miller Act of the 83rd Congress, legal limits for crop residues are being established for all these agents, both the newer ones and those in use for many years.

3. Present Research Inadequate: A cursory review of current grants in the area of pesticides indicates the need for much more support. For the calendar year 1956, there were approximately 17 NIH grants that dealt primarily with the toxic effects of pesticides. Most of these are academic investigations concerned with mechanism of action, effects on enzyme systems, tissues, intact organs, and other basic approaches. One grant is concerned with the practical approach to the field use of insecticides. At Utah State Agricultural College, under grant RG-2384(C5), an investigation is under way to determine the efficiency and hazards following application of endrin and systox to growing alfalfa. This work is concerned primarily with the effects of these compounds when the treated alfalfa is fed as hay to farm animals. Observations to determine physiological and pharmacological effects are made on calves fed the milk from cows consuming the treated hay, on rats fed the butter, or fed lean or fat tissues from both the cows and the calves, and also on rats fed eggs from hens consuming the treated hay. Endrin feeding is also being used experimentally to determine its effect upon the utilization of vitamin A and carotene.

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*Surgeon General Leonard A. Scheele

A concerted effort is needed to encourage both basic and applied types of research. The former may eventually relate toxic effect with chemical structure so that the pesticide molecule can be altered or adapted to produce species specificity. If successful, fungi, insects and rodents may be better controlled with less risk to man. Applied research also is needed to determine the actual hazard and toxicity of the commercially available pesticides.

4. Newer Techniques Applicable: While traditional types of toxicity tests are being used, the need exists for newer techniques and methods to reveal undesirable effects before permanent, irreversible pathological damage is produced. The newer techniques in psychology and psychopharmacology may be adaptable to toxicity tests. Performance tests such as the effects on reflexes, on learning, on time-motion studies, and on tasks of varying degrees of complexity may show abnormalities in response well before objective signs and symptoms. Such tests could be made on persons who are exposed through their work with these chemicals in the early stages of their development, production and use, before the stages of animal testing and marketing are reached.

From past experience, it is known that traces of phosphate insecticides can produce minor effects in a user without his awareness. Personality changes have been observed which were serious enough to affect the individual's judgment and adversely influence his decisions. Similarly, delayed reaction times, due to slight exposure of these toxics, may be critical in operating farm machinery or driving a car. It is now felt that these substances may be contributory causes of accidents. Other observed psychological effects may include euphoria, apprehensiveness and irritability. It is known that pilots who dust crops with insecticides experience euphoria and are prone to discard protective respiratory devices and even to take needless chances in flying. Irritability, on the other hand, can involve the exposed individual in unpleasant situations that can be disruptive.

5. Research Areas Needing Exploration: In addition to the prevalent testing of acute, sub-acute and chronic toxicities of pesticides and their residues on food, similar problems of safety arise from the presence of antibiotics and intentional food additives. Here, too, psychopharmacological tests might be found to be applicable. The National Institutes of Health is supporting little, if any, research primarily concerned with these substances.

The implications and ramifications within this area are many. When simple evaluation tests are completed and hazards are evaluated, many questions still arise. Among the research areas that need exploring are:

a. The effects of additives, both incidental and accidental, on the nutritional value and "eatability" of fruits and vegetables.

b. Synergistic effects of mixtures of these compounds, on farm animals and on man.

c. The effects of antibiotics, used for supplementary feeding of farm animals, on the milk, meat and fat of these animals.

d. The effects on the consumer of ingesting trace amounts of antibiotics in animal products; for example, the effect that prolonged ingestion of these animal products may have on the normal response to therapeutic doses of antibiotics.

e. The effects of combinations and cross-combinations of antibiotics, pesticides and intentional food additives in the diet. Prolonged ingestion of any mixture may yield different results from those to be expected from tests on the single components of the mixture.

f. Effects of food additives, especially antioxidants, on intestinal flora. Will their presence in the intestinal culture medium lead to greater or less sensitivity of the animal host to ingested pesticides, or ingested antibiotics? What are the effects of these additives, singly or collectively, as they occur in a normal diet, on intestinal absorption and subsequent metabolism?

Tests to answer questions such as these are likely to be complex, but they are necessary to supplement simple toxicity tests. There is no National Institutes of Health support in these areas.

6. The Possibility of Complex Interactions: There is a tendency to conclude that the lack of published fatalities and of epidemics associated with these agents is proof that the substances are harmless. But effects considerably short of death or of acute poisoning may result from their continued use. It is in these areas of subtle chronic or acute effects, not recognizable as associated with intentional or incidental additives, that information is lacking. Headaches, diarrhea, increased susceptibility to respiratory infections or low grade infections that sap energy and produce malaise, have important effects on the economy and account for millions of hours in lost time. Are these effects aggravated by the complex diet of unsuspected traces of chemicals?

Epidemiological evaluations of man and his complex environment are associating such separate entities as smoking, automotive exhausts, and atmospheric pollutants with the incidence of cancer of the lungs. Does the ingestion of trace amounts of pesticides, food additives and antibiotics have any such association? Could the addition of these three classes of chemicals to man's diet increase, decrease or facilitate the incidence of cancer? Evidence to prove or disprove the carcinogenicity of the mixtures of trace chemicals found in man's diet is lacking. Carefully planned research could supply the evidence and would allow adequate protection of the consuming public while allowing an undiminished annual output of foods and food products.

The Division of Research Grants proposes to stimulate research in some of these areas, not now accepted by any Institute as a primary responsibility.

Staff work during the year has given preliminary promise of a challenging field for research endeavor.

E. Research in Radiation

During the past year the Radiation Study Section, established in May 1955, has undertaken the development of ways and means for (1) determining the general scope of the health hazards of radiation and for (2) stimulating and coordinating needful research. In spite of the tremendous amount of research in the field of nuclear energy, much of the procedure in the use of X-ray equipment has remained relatively unchanged, with too little attention to the hazards involved. Although these hazards are recognized, a great deal needs to be known regarding the extent to which they prevail. Only the order of magnitude of such hazards is known with any degree of accuracy.

1. Certain Quantitative Data: As background information on the health hazards of radiation the following data have been assembled by the Radiation Study Section from various sources.

a. It has been estimated that in 1953 there were 3,000 X-ray machines operated by medical radiologists; 32,000 by physicians, 10,000 by osteopathic physicians and chiropractors, 15,000 in hospitals and clinics, and about 65,000 additional radiographic units used by dentists. These total approximately 125,000 units for the country at large.

b. In 1951 Donaldson estimated there were 25,000,000 radiological examinations per year in this country, presumably by radiologists alone. No reliable estimate has been made of the examinations by non-radiologists, although the rate of such examinations by dentists is known to be quite high. Excluding dentists, and assuming that the number of exposures by other non-radiologists is approximately double those made by radiologists, a figure of over 90,000,000 exposures per year is indicated. In addition, an estimated 16,000,000 mass chest survey films were taken in 1953, and over 5,000,000 X-ray exposures for therapeutic purposes were made.

2. More Survey Data Needed: The distribution of exposures in terms of body areas, through fluoroscopic examinations, cine-fluorography and other methods, is unknown as is the dosimetry involved in many of these methods. Specifically, information is needed regarding the (1) types of equipment in use; (2) the various types of examination (or therapy) given; (3) the amount of radiation received by operators and (4) the amount of radiation received by the patient. All four of these are subject to wide variation.

Usage at high dosage levels is generally for control ofmalignant disease. Since patients receiving such dosages are likely to have ended their period of reproductivity, there would seem to be little genetic hazard through gonadal exposure. Some therapeutic exposures are given, however, for nonmalignant disease such as acne, which is found primarily in the young. It is desirable, therefore, that information be collected on the extent of gonadal, as well as somatic, exposures as they may occur at any stage of life.

It is also highly probable that the number of X-ray exposures is increasing each year, with a concurrent increase in the problems involved, both recognized and unrecognized.

3. Hazards Must be Explored: The Radiation Study Section is convinced that a major effort must be made to determine the hazards that exist in common usage and that the cooperation of scientifically trained individuals in the entire scope of the radiation problem must be obtained. In addition to the broad survey of usage, some refined points of information are necessary:

a. Age distribution of population as a function of exposure to ionizing radiation, including the frequency of the various types of exposures in each age group -- necessary in order to permit estimation of gonadal dosage capable of affecting reproduction.

b. Information regarding fertility as a function of the frequency of such X-ray examinations, and information relating to the condition under which the patient is receiving X-ray exposure. It is conceivable that persons who have a large amount of exposure to radiation will have exhibited a lower fertility rate than those receiving smaller amounts.

c. Differences in population exposure by age and by class of hospital or medical care institution and by private office practice of physicians, chiropractors, osteopaths and dentists.

4. Biological Response to Radiation: In addition to the need for a survey of the problems involved in radiation hazards, there is recognized need for additional research on the biological response to radiation exposure. Follow-up studies should be made on the large numbers of individuals exposed to ionizing dosages under controlled conditions and for specific purposes. For example, studies can be made on long term survivors from among patients with neoplasm who have had large amounts of ionizing radiation to small areas of the body. Studies can also be made on many thousands of children subjected to radium applicators for reduction of lymphoid tissue of the nasopharynx, as well as on children subjected to X-ray treatments for acne. There is also today a large industrial population that is being exposed to radiation.

Concurrent with biological studies of the effects of ionizing radiation, a great deal more research is needed on the effects of varying kilovoltage filtration, as well as on devices for more precise measurement of beta and gamma ray exposure. Many disciplinary approaches are needed in studies such as these and in nutritional and chemical protection studies, studies on constant exposure to radioactive fallout, etc.

F. Research in Environmental Health

This extremely broad field encompasses many interests and disciplinary approaches and includes not only areas needful of research but also many areas for the application of research findings from laboratories outside this field. These matters have been discussed in a report prepared by a Subcommittee of the Sanitary Engineering and Occupational Health Study Section, meeting in September 1956, from which much of what follows has been taken.

1. Industrialization Brings New Health Problems: The industrialization of the United States has brought with it a host of problems involving the health of a large and growing proportion of its citizens. We work and live in an environment dominated by technological applications of the physical sciences -- to industrial production and to many of the activities of community life (transportation, communication, etc.). The present high incidence of accidents, as well as the hazards, nuisances, inconveniences, discomforts and anxieties arising out of stream pollution and air pollution, has revealed gross weaknesses in the armamentarium of medical science to combat disease. There is need for further development of the methods of occupational hygiene, and for their broader application to the hygienic problems of industry and of the entire industrialized community. These needs can be met only by extensive and intensive efforts to recruit and hold capable professional and technical personnel, to provide opportunities for their sound training, and to forge new patterns of professional education, organization and service.

2. Need for Trained Personnel: The specific needs for trained personnel were visualized as follows:

a. Physicians are needed who are broadly trained in the disciplines involved in various phases of the practice of occupational medicine, both preventive and clinical.

b. Engineers are needed, at both the professional and technical level, who are trained in the application of the physical sciences to the appraisal and control of the occupational environment with particular reference to occupational sanitation.

c. Investigators are needed who are trained in the biological and physical sciences, including toxicology and hygiene, and are adequately oriented toward the many environmental health factors peculiar to an industrial civilization -- contamination of food, stream pollution, air pollution, accidents on highways and in the home, noise, haste, anxiety, and other stresses.

d. Industrial nurses are needed with specialized training for the situations they are going to meet.

3. Opportunities for Training, Medical: Leaders in medical education and leaders in public affairs have already begun to recognize the health significance of the changes in modern society induced by industrialization,

and a number of medical educational centers have now begun to offer the training needed for research and practice in the specialized field of occupational and environmental health. In view of the urgency of the need for trained personnel, effort should be made to lower the economic hurdle now existing between the available opportunities for such training and its acquisition. The pathways to specialization in other fields of medical practice have long been smoothed by certain opportunities for securing financial support. Financial assistance to professional trainees in occupational medicine has so far been offered by only one educational institution and one governmental agency (A.E.C.) that found itself in dire need of these specialized services. The incentives to enter this field of practice are at present wholly inadequate.

4. Opportunities for Training, Sanitary Engineering: The situation in sanitary engineering is somewhat comparable. Graduate training in sanitary engineering is not easily or widely available and most of the men engaged in this field of practice have had to make their own adaptation from their (unspecialized) undergraduate training in engineering. Furthermore, the longer established fields open to graduates of engineering and technical schools are so rewarding (on the basis of the immediate needs and demands of industry) that graduate training in the engineering sciences tends to be limited to these fields. The attractions of industry are even making it difficult to hold top-flight educators in the engineering-educational field. It has been suggested, in view of the latter problem, that grants to educational institutions may be a first requirement to promote graduate training in sanitary engineering and related fields.

5. Broadly Trained Scientists Urgently Needed: The dearth of professional personnel of the several types listed is so acute that consideration should be given to plans to give financial aid to persons desiring training, even though their intent is practice and not research. Only by development of an adequately large population of personnel interested or occupied in the field of occupational and environmental health can we hope to enlist the interest of a proportion of this population in careers in research in this important field.

It should also be emphasized that training of individuals solely in one or another of the "splintered parts" of the over-all field of occupational and environmental health (e.g., air pollution, water pollution) will not meet the need. The basic need is for broadly trained scientific investigators. It is hoped that Public Law 159 and Public Law 611, providing funds for training of research personnel in air pollution and water pollution respectively, may be so interpreted as to permit the application of these laws to meet the urgent nedd for investigators who are oriented in this broad field.

6. Study Section Liaison with Other Agencies: The Sanitary Engineering and Occupational Health Study Section, in its deliberations and efforts toward increasing interest in this research field has established close working relationships with three Bureau of State Services'

facilities: the Division of Sanitary Engineering Service; the Division of Special Health Service; and the Robert A. Taft Sanitary Engineering Center.

G. Research in Tissue Fine Structure and Human Genetics

The Morphology and Genetics Study Section has served as a coordinating body to encourage research in the new and expanding research area in which the electron microscope is the essential tool, and in the older but neglected field of human genetics.

1. Electron Microscopy Conference: In regard to electron microscopy, the Study Section sponsored a three-day "Conference on Tissue Fine Structure" at Arden House, Harriman, New York, in January 1956. Approximately one hundred investigators attended.

The program was carefully balanced between invited and volunteered papers by a committee under the chairmanship of Dr. Keith Porter. Topics included: "Techniques", "Vascular Systems of the Cytoplasm", "Components of the Cytoplasmic Matrix", "Differentiations of the Cell Surface", "Extracellular Components" and "Mitochondria". The proceedings of the conference were published as a 449-page supplement to Volume 2 of the Journal of Biophysical and Biochemical Cytology, 1956.

This was the fifth conference sponsored by the Morphology and Genetics Study Section. The previous conferences were:

Conference on Microspectrophotometry of Cells, 1951
Tissue Transplantation Conference, 1952
Conference on Problems and Methods in Human Genetics, 1953
Conference on Experimental Hepatomas, 1954

2. Medical Genetics: The members of the Morphology and Genetics Study Section are also prepared to expend continuous effort toward encouraging research and training in the neglected field of Human Genetics. The following observations represent the views of the Study Section as expressed in their Memorandum of Procedure of September 5, 1956:

3. The Task Before Human and Medical Genetics: Human genetics as a science deals with variability in man regardless of the causal factors. It is necessary that all variations be included within the purview of the geneticist if he is to sort out those variations having a genetic origin. Human geneticists are interested in the frequency and distribution of traits and their corresponding genes among population groups; the pattern of heredity, if a trait is due to inheritance; the recognition of heterozygotes; the probability that a given individual will have any particular trait; and the variations of a trait among individuals with a recognized hereditary characteristic. If hereditary traits affect man's health, they become problems in medical genetics. The genetics of microorganisms and other organisms, insofar as such organisms may affect the health of man, becomes a part of medical genetics.

As medical science learns to control the diseases and defects caused by environmental agents, hereditary defects assume a greater importance. Methods must be sought to prevent or to diminish the deleterious effects of genes. It is evident that the genetics of a trait may be determined long before we recognize that the genotype has any effect on man's health. A gene may affect more than one characteristic. The totality of the deleterious effect of the gene may therefore escape detection, especially if only its most striking effect is identified and studied. The reduction in viability or health that occurs in an individual who has a certain genetic type may be in a manner quite foreign to expectation.

Advance in knowledge of human genetics, with the accompanying possibility of control of hereditary traits, will be brought about by study of physiological, biochemical, and morphological variants more effectively than by study of the more complex diseases of man. After a pattern of heredity for a variant becomes established, investigations can be made as to the effects of each genotype (heterozygote and homozygote) on viability and health.

4. Availability of Students of Human Genetics: We have a scarcity of scientists who are engaged wholly or primarily in research in human and medical genetics. Until recently little was done to make the field attractive for a scientific career. Other than the folklore which often gave erroneous opinions about human genetics, the average college student had little contact, if any, with genetics until late in his college career. By then he was already well along the way toward his chosen career -- medicine, law, engineering, or agriculture. Even if the student developed an interest in basic genetics, he was unlikely to choose human genetics for a career. He noticed that persons trained for careers in animal or plant genetics had little difficulty in finding positions for teaching and/or research, whereas opportunities for teaching or research in human genetics were scarce or non-existent. Accordingly, most young geneticisits chose to work with other experimental organisms.

These conditions still prevail, but fortunately the outlook is much improved. More members of the medical profession are becoming willing and even eager to cooperate in research in human and medical genetics. A number of universities, medical schools, hospitals, and research institutes are seeking staff members trained in human genetics. Other institutions have an interest in the subject but lack sufficient funds to add members to their staffs.

Currently, universities are now graduating approximately twenty geneticists annually, not counting those trained for applied research. Of these, only a very small number are trained in human genetics. There are possibilities for augmenting the number of persons working in human genetics, however. They can be recruited from graduating geneticists and from members of other professions who have the background necessary for genetics and are able to take additional training. Younger students can also be given an interest in human genetics early in their college careers.

5. Essential Training: Ideally a human or medical geneticist is one who has had broad training in basic genetics. He also needs a background in mathematics including biometry or statistics, and will benefit from a knowledge of embryology, anatomy, serology, bacteriology, physiology, and pathology. If a faculty member of some university, he may have the responsibility of teaching one or another of these related subjects.

It is essential that the student in human genetics be capable of designing and carrying out research in experimental genetics. Ability to collect familial data and to analyze case histories is not sufficient. He must learn by experience the basic research techniques and the basic problems of geneticists.

6. Recommendations of the Study Section: On September 5, 1956, the Study Section forwarded to the National Advisory Heart Council a memorandum of recommendations directed toward relieving the present shortage of medical (including human) geneticists. The recommendations were that:

a. Effort should be made to incorporate medical genetics in the curriculum of all accredited medical schools. Instruction should preferably be in charge of a trained human geneticist. Five year NIH support at approximately $10,000 annually would be needed to attract such men.

b. In view of the shortage of men competent to take the responsibility of heading departments of medical genetics in medical schools, career fellowships paying $10,000 should be set up to permit interested medical graduates, Ph.D.'s and D.Sc.'s to have a year of training in medical and human genetics. The year of training would permit the trainee to qualify as a medical or human geneticist and conduct genetic research.

c. To supplement the foregoing, in order to more quickly fill the present vacuum, four to six weeks' summer courses should be set up in medical and human genetics, including recent advances and methods. This course would be offered at an educational institution now having a strong staff in genetics and would be open to medical scientists, including clinical investigators, not now qualified in genetics. These men, on returning to their own institutions could serve as stop-gap teachers of genetics courses and would be in a position to recognize opportunities for orienting their own clinical or laboratory research into genetic channels. It is envisioned that each summer session might attract 10 or 12 investigators previously working in other disciplines. Students could be subsidized to the extent of an $800 scholarship each.

d. Predoctoral research assistantships and/or scholarships should be available to students desiring to work for a Ph.D. degree in genetics. It is contemplated that the total training would extend to three years, the first at $1800, the second at $2200, the third at $2400, with $350 additional for each dependent. If as many as 15 such students were supported in any given year the total annual outlay would be in the neighborhood of $55,000.

e. Summer assistantship merit awards, each of $400.00, should be established to permit undergraduate students to get research training in genetics. The genetics laboratory would offer employment as laboratory assistant to a promising student. He would be permitted to take such summer course work in genetics as might be available. It is comtemplated that 20 such students might be offered these assistantships each year.

The Morphology and Genetics Study Section members are currently discussing Item c (summer training or refresher course) with one individual who is teaching medical genetics and is actively engaged in research in human genetics. He has agreed to consider giving such a course and to present a program which he will follow provided funds become available. The Study Section will examine the proposal, and if it is acceptable, will recommend it to the Council.

7. Recent Progress: As the result of the personal efforts of one of the Study Section members, the Medical School at the University of Wisconsin has shown a definite interest in developing the area of medical genetics. In December 1956 a conference was held between Dr. C. P. Oliver, Chairman of the Section, Dr. John Z. Bowers, Dean of the Medical School and Dr. D. E. Copeland, Executive Secretary of the Section. Dr. Bowers already has on his staff a geneticist well-trained in biostatistics, Dr. Newton Morton. He is presently negotiating for two more men: one is nationally known as a microbial geneticist and the other is presently working in radiation genetics with the AEC. As the result of the conference, Dr. Bowers is applying for support of a symposium at Wisconsin in the fall of 1957. Ten to twelve speakers will be chosen to discuss the application of genetic methods to various areas of medical research. In future years, this symposium may well develop into the summer course which was included in the above recommendations.

In addition to the University of Wisconsin and University of Washington efforts mentioned above, which were sparked by individual members of the Study Section, inquiries have been received from Dr. Victor A. McKusick, M.D. at Johns Hopkins University. He, together with Drs. Bentley Glass and Barton Childs, have been sponsoring a series of lectures on human genetics for the medical students at Johns Hopkins. It is hoped to expand this interest in several ways which have yet to be discussed. The important point pertinent to this report is that Dr. McKusick heard "rumors" that the U.S.P.H.S. would support such efforts. It illustrates that if a neglected area receives nutrient, growth soon appears.

The inheritance of spherocytosis (neonatal Jaundice) and the development of methods to negate its effect can be cited as a typical example of genetic-medical problems. The characteristic is inherited as a dominant with varying strength of expression. The homozygous condition has not been described since it is undoubtedly lethal. In the heterozygous condition the individual suffers hemolytic anemia and at birth may exhibit marked jaundice. The spleen enlarges, this being one of the prime diagnostic points. The erythrocytes also show osmotic fragility and tend toward a spherical rather than normal biconcave shape. Biochemical research shows that the defect is located in the enzyme systems governing glucose metabolism in the erythrocytes and can be temporarily reversed by adenosine. There is as yet no way of correcting the enzymatic defect, though correction is theoretically possible. Instead, a very effective "cure" is to remove the spleen. By use of radioisotopically labelled blood it was demonstrated that the spleen is unusually sensitive to the spherocytes and destroys them in great number, producing anemia. Removal of the spleen does not prevent spherocytosis but it does allow the spherocytes to live longer and permits the blood cells to give nearly normal service.

As the result of Study Section stimulation, the University of Washington Medical School, Seattle, has submitted a research grant application that would greatly strengthen research and, as a byproduct, the teaching of human genetics. The principal investigator is Dr. Arno Motulsky, a qualified clinician in the field of hematology with an interest in genetics demonstrated by several publications. A joint Morphology and Genetics Study Section and Heart Council visit to Seattle in December 1956, revealed that Dr. Motulsky has the enthusiastic support of Dr. Williams under whom he is a staff member in the Department of Medicine. Dr. Reynolds, Chief of Preventive Medicine, is also supporting the effort by presently furnishing laboratory space and one-half time of a technician. Dr. Evans in Microbiology and Dr. Aldrich in Pediatrics also expressed cooperative interest in the effort.

The Morphology and Genetics Study Section intends, primarily through individual effort, to continue the development of interest in research in human genetics. Medical schools are obvious targets but not necessarily the only agencies in accomplishing this end.

II. Advisory Committee on Epidemiology and Biometry

The Advisory Committee on Epidemiology and Biometry was established by the Division of Research Grants to help discharge the Division's newly assumed responsibility of the unified administration of grant programs for the training of epidemiologists and biometricians. The Committee is composed of eleven outside experts, four Service representatives, and liaison representatives from each of the Institutes.

The duties of the Committee have been outlined as follows:

1. Survey the status of research training in epidemiology and biometry in the country.

2. Advise on how programs can best be stimulated in the field of training in epidemiology and biometry.

3. Review applications for training grants in these fields.

4. Act as advisers and consultants to Study Sections of NIH on any pending applications involving epidemiology and biometry.

5. Serve as special resource to the NIH for the development and operation of programs of epidemiology and biometry within the Public Health Service.

III. Program Analysis Section

The Program Analysis Section of the Division of Research Grants indexes reports and publications resulting from Public Health Service-supported research, as well as publications from National Institutes of Health scientists.

The services of the Program Analysis Section are available to aid administrative personnel in answering inquiries regarding the achievements of such Public Health Service-sponsored research and the nature and extent of these investigations; and to research personnel interested in the various facets of scientific endeavors of workers in their own and related fields.

Since the Section was established three years ago, more than 32,000 documents, representing all available publications received since the inception of the PHS grants programs, have been processed. Documents are indexed according to a system which employs descriptive single words or logical combinations of words rather than predetermined categorizations. Each document is identified by an average of twenty terms. The basic vocabulary for this library of documents now totals approximately 20,000 alphabetical cards, containing numbered references to the documents in which the term appears. The vocabulary is expansible as new concepts occur. The original documents are filed in the Section and are available for administrative use on a loan basis. Bibliographic lists of grantee-publications also can be furnished.

Although the majority of the work of the Section during the year 1956 has been involved in indexing and processing the backlog of accumulated documents and attempting to keep current the more than 5,000 reports and publications received during the year, the Section has been able to answer about 100 inquiries pertaining to PHS-sponsored scientific research. The inquiries varied in complexity from specific requests which could be answered immediately, to the more general questions which involved many man-hours. Answers to inquiries fall roughly into the following three categories which illustrate the purposes which the Section can serve: (1) Aid to administrators in program activities; (2) Aid to research scientists; (3) Aid in answering miscellaneous inquiries. An elaboration of the three functions appears below.

(1) Aid to administrators in program activities

The method of detailed indexing used in the Section results in an extensive cross-reference file from which can be extracted detailed data which are extremely difficult to retrieve from conventional subject-matter classifications. The system gives both a cross-sectional and a longitudinal view of the PHS research programs because it includes all available data from grantees of all Institutes since the inception of the various programs. It is therefore particularly useful in assisting administrators seeking comprehensive, detailed information for program planning. Approximately 50% of the inquiries handled by the Section in 1956 has been in response to requests for this type of information.

For example, one administrator made separate requests of each of the seven Institutes for a listing of all past and current investigations involving bacterial, viral, fungal, and rickettsial studies. Six of the Institutes channeled their requests to the Program Analysis Section, which compiled a 160-page report showing project number, name and address of investigator, title of project, and period of support of more than 1,200 grantees. The compilation required six weeks for completion but resulted in a listing which was deemed of "greatest value" to the recipient in facilitating efforts "to determine the areas which have been supported in the past and those areas which may need further encouragement."

Another listing prepared recently for programming activities presented a review of PHS support in the field of radiation. This analysis categorized the support according to seven areas, as follows: I. Radiation therapy: (a) X-ray; (b) Radium therapy; (c) Radioisotope therapy; (d) Experimental therapy; II. Radiology: (a) Diagnostic; and (b) Analyses; III. Radiobiology: (a) Acute effects (immunology, circulatory physiology and emetic system); and (b) Chronic effects, (1) Somatic; and (2) Genetic; (c) Biochemistry; (d) Microbiology; IV. Techniques: (a) Development of X-ray techniques; and (b) Techniques using X-ray to produce experimental conditions; V. Radiation Protection: (a) Biological effects; and (b) Physical techniques; VI. Radioisotopes as tracers; VII. Miscellaneous.

This task involved several weeks of staff time.

Immediate answers were furnished for requests for specific information in program activities such as studies regarding accident-proneness; research in Staphylococcus and Leptospira; and investigations in the field of cardiovascular physiology in which isotopes are utilized.

(2) Aid to research scientists

Although the indexed reprint collection of the Section is restricted to publications resulting from PHS support, it serves as a convenient adjunct to library resources in offering an up-to-date index of a large segment of current medical and biological literature. During the year 1956, the Section has aided numerous NIH scientists in literature searches. Typical of the data provided NIH scientists are references to publications concerning: acid-fast chromogenic bacteria; skin tuberculosis; anaphylaxis research; and publications describing inclusion bodies occurring in the body cells as a result of virus infections.

(3) Aid in answering miscellaneous inquiries

The facilities of the Program Analysis Section are at the disposal of the various PHS administrative or information offices which receive inquiries from nongovernmental as well as official sources. For instance, a systems research and development firm, interested in the feasibility and possible utilization of a nuclear research facility in the southwest, was furnished with a list of PHS grantees in the southwestern states who are conducting research involving the use of radioisotopes. For an inquirer from New York, a list was prepared showing investigators using C57BL and DBA strains of laboratory mice in institutions located in the New England area. A featured article in Life Magazine led to a vague inquiry as to "whether the National Institutes of Health was dispensing '8-MOP'," which was referred by the Program Analysis Section to the PHS investigator whose experiments with 8-Methoxypsoralen had been described in Life. For an orthopedic surgeon preparing his presidential address to the American Academy of Orthopaedic Surgeons, a report was prepared showing the expansion of PHS support in the area of neuro-musculo-skeletal research during the past four years.

Other uses of the Program Analysis Section's facilities

The files of vocabulary terms which contain numbered references to the indexed documents are available to PHS personnel who wish to compile material independently. Individuals from several of the Institutes have used the Section's facilities for the preparation of their own tabulations. In addition, the relatively complete library of PHS-supported publications has been used by personnel of several of the Institutes as a basis for comparing their own reprint collections.

Improvements in the indexing system

The indexing system in use is under continuing critical study for weaknesses and/or possibilities of improvement. This study has led, from time to time, to modifications of indexing techniques that have enhanced the usefulness and the accessibility of indexed material. Revisions in clerical procedures have also been made in an effort to streamline the recording processes.

In October 1956 the Chief of the Section attended a five-day Seminar on Classification held at Western Reserve University, where much useful knowledge was obtained from and about users of similar systems. The Chief also recently visited the Technical department of the National Lead Company at South Amboy, New Jersey, to discuss mutual problems with the user of a comparable classification scheme. A five-day visit was made also to the Institute of Experimental Medicine and Surgery, at the University of Montreal, directed by Dr. Hans Selye, to investigate the classification method which Dr. Selye has devised and which he uses in the field of endocrinology.

It is hoped that as sufficient staff becomes available, the Section will be able to incorporate desirable features of other methods and make additional revisions in its present system to improve the efficiency of the uniterm method of data processing and retrieval.

Research Fellowships Branch

The Research Fellowships Branch services Research Fellowships programs for all Institutes and the Division of Research Grants. Sixteen separate programs are now in operation. These include Full-time Research Fellowships on the Predoctoral, Postdoctoral, and Special levels; Senior Research Fellowships; Part-time Research Fellowships for Medical, Dental, Public Health, and Nursing Students; Nursing Training Grants; and the Visiting Scientist program.

The aim of the total operation is to supply additional and better trained personnel to carry on the rapidly expanding medical research programs; to recruit and orient toward research, students in professional schools related to health; and to bolster up the structure of basic medical science departments in medical, dental and public health schools. The Visiting Scientist program is operated for the several Institutes of the National Institutes of Health and other Public Health Service research activities, to encourage exchange of scientific "know-how" between eminent scientists from both domestic and foreign institutions.

Highlight of the year was the activation of the Senior Research Fellowship Program. These fellowships are designed to bolster the preclinical science departments of medical, dental, and public health schools, and carry a commitment for five years. The Senior Research Fellowship Selection Committee met for three days in October and recommended for award 44 applications out of the 109 received. The National Advisory Health Council subsequently confirmed these actions and recommended them to the Surgeon General for payment. It is anticipated that a like number of new awards will be made in each of the four succeeding years to bring the total active Fellows to 200-250. At that time, a study of the impact of the program will be made to determine the level at which future support should be maintained.

After continued study and discussion with the National Science Foundation, which indicated that the Public Health Service stipends for Predoctoral and Postdoctoral Fellows were out of line with those of other granting agencies, the Surgeon General approved an increase of $200.00 for Predoctoral and $400.00 for Postdoctoral Fellowships, effective for awards made after January 1, 1957.

Student Part-time Research Fellowships, designed to orient students toward careers in research by providing basic training, were continued in the medical and dental schools and similar programs were initiated in the schools of nursing and public health. During the year, this program has provided research experience for a total of 896 students in 144 of these schools. The Surgeon General approved an increase of $200.00 for each fellowship unit, raising the amount from $400.00 to $600.00. Notice of this increase resulted in a most appreciative response from the deans and sponsors. Medical schools were allowed 8 units each; dental schools 6 units each; and school of public health and nursing 4units.

A small Research Fellowship program has been developed for the Division of Sanitary Engineering, Bureau of State Services, using Division of Research Grants funds. One award has been made to date.

A "house-keeping" operation for the new Nursing Training Grant Program (Title II, P.L. 911) has been provided for the Division of Nursing Resources, Bureau of Medical Services. Awards of 553 units have been made to 56 schools of nursing and 520 notices of appointment have been received from participating schools. In addition, the Research Fellowships Branch professional staff assisted in analyses and provided statistical data to the Division of Nursing Resources on this program.

Health Research Facilities Branch

Section 710 of Public Law 835, 84th Congress, states:

"(a) The Congress hereby finds and declares that (1) the Nation's economy, welfare, and security are adversely affected by many crippling and killing diseases the prevention and control of which require a substantial increase, in all areas of the Nation, of research activities in the sciences related to health, and (2) funds for the construction of new and improved nonfederal facilities to house such activities are inadequate.

"(b) It is therefore the purpose of this title to assist in the construction of facilities for the conduct of research in the sciences related to health by providing grants-in-aid on a matching basis to public and nonprofit institutions for such purpose."

By Section 704 there is "authorized to be appropriated for the fiscal year ending June 30, 1957, and for each of the two succeeding fiscal years, not to exceed $30,000,000 for making grants-in-aid for the construction of facilities for research in the sciences related to health; and any sums appropriated pursuant to this section shall remain available until expended." By appropriation in the Second Supplemental Appropriation Act for the fiscal year 1956-57, Public Law 855, 84th Congress, there was made available $30,000,000 for this year.

As a result of the initial meeting of the National Advisory Council on Health Research Facilities on September 24 and 25, 1956, seven of 31 applications on hand at that time, (totaling $765,169) were recommended for payment because of their urgent need. The remaining applications were deferred until the December 3, 4 and 5 meeting, in order to permit project-site visits and to obtain more adequate information as to the broad needs of the program throughout the country.

During the interval between Council meetings, 54 project-site visits were made by "teams" of Council members, each accompanied by a staff assistant from the Branch. Of 129 formal applications on hand at the time of the December Council meeting, 73 were recommended for approval in the total amount of $24,460,467. Added to the total of $765,169 approved at the September meeting, a grand total of $25,225,626 was approved during 1956 for payment from Fiscal Year 1957 funds.

At the end of 1956, 140 institutions had formally applied for research construction grants and 88 more had officially indicated their intention of filing applications. The total federal funds requested by these 228 institutions during 1956 is $116,620,214. A substantial increase in this requested amount may be expected during 1957, since 321 other institutions have received application forms upon their request but have not as yet made application.

At its meeting on December 5, 1956, the Council made the following recommendation, which was transmitted to the Congress by President Eisenhower in January 1957:

"As is demonstrated by the foregoing sections of this report, the magnitude of the funds requested for worthy projects greatly exceeds the amount of money made available by the Congress for fiscal year 1957. The Council would propose: (1) to assure the Congress that had greater funds been available for fiscal year 1957 they could have been wisely invested in the extension and advancement of health research facilities, and (2) to request that the Congress have this assurance strongly in mind as it considers the immediate and future health needs of the Nation."

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(Attachment I)

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PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-1
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Office of the Chief
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Administration of the Division of Research Grants
PROJECT TITLE

7. Ernest M. Allen, Sc.D.
PRINCIPAL INVESTIGATOR

8. Dale R. Lindsay, Ph.D., Errett C. Albritton, M.D., Katharine A. Parent, Roland P. Maher, and secretarial staff
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Office of the Chief, Division of Research Grants, is the core of the central administrative organization that provides scientific evaluation of applications for research grants and fellowships to encourage and support research, investigations, and training in health, medical, dental, nursing, sanitary engineering, and allied fields, including the effective development and utilization of hospital services, facilities, and resources and for promotion of coordination of such experiments and demonstrations, and the useful application of results for the various Public Health Service sponsoring programs. In addition, it administers support for such research and research fellowships not supported by these other sponsor's programs. It conducts the fiscal control and audit of the funds expended in the entire program and functions as a focal point of liaison service with these programs and with other agencies, Federal and nonfederal, engaged in support of similar research.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRG-1
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$34,847	($90,053*)	$124,900	3	12.3	15.3

*Reimbursement from all Institute R&A activities.

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	3	15	18	

13. BUDGET ACTIVITY:

RESEARCH	☐	ADMINISTRATION	☐
REVIEW & APPROVAL	☒	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☐		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO.(S):

All NIH Institutes review and approval activities.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-2
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Research Grants Branch
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Administration of the Research Grants Branch
PROJECT TITLE

7. Dale R. Lindsay, Ph.D.
PRINCIPAL INVESTIGATOR

8. Dr. Eli M. Nadel, Dr. Irvin Fuhr, Dr. Berwin A. Cole, Mrs. Jane Knapp, Mrs. Elizabeth Fuller
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Research Grants Branch administers the twenty-four study sections' scientific review and evaluation of applications for research grants for the various Public Health Service sponsoring programs and provides support for research in noncategorical and basic areas not supported in the other Public Health Service Programs. It is responsible for the selection and utilization of over 350 leading scientists in a wide variety of disciplinary fields in the review and evaluation of the research grant applications received, and for the maintenance of an information retrieval system regarding the fields of interest and the results of research throughout the entire research grants program, categorical and noncategorical.

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PUBLIC HEALTH SERVICE --- NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRG-2
SERIAL NUMBER

12. **BUDGET DATA:**

ESTIMATED OBLIGATIONS			MAN YEARS		
DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
$140,811	($363,889*)	$504,700	25	41.2	66.2

FY'57

* Reimbursement from all NIH R&A Activities

BUDGETED POSITIONS			PATIENT DAYS
PROF	OTHER	TOTAL	
25	52	77	--

FY'57

13. **BUDGET ACTIVITY:**

RESEARCH ☐
REVIEW & APPROVAL ☒
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO.(S):

All NIH Institutes Review and Approval Activities

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-3
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Biochemistry Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in biochemistry.
PROJECT TITLE

7. C. Donald Larsen, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Elise Woodard
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Biochemistry Study Section reviews and evaluates applications for research grants in nearly all of the sub-disciplines of "biochemistry," i.e., carbohydrate chemistry, chemistry of hormones and sterols, chemistry of cellular particulates, chemistry of proteins, peptides, and amino acids, chemistry of biological pigments, chemistry of lipids, chemistry of purines and pyrimidines, chemistry of immunologic phenomena, chemistry of pharmacologic and toxicologic drugs, chemistry of organo-metallic compounds and trace elements, function and chemistry of antibiotics, metabolism of bacteria, fungi, and molds, energy mechanisms, enzyme chemistry and kinetics, nucleic acid chemistry, virus chemistry, vitamin function and chemistry. With such a wide range of specialty approach, it is necessary that the membership of the study section cover these specialties as nearly as possible in the broad disciplinary areas. Not only does the Biochemistry Study Section have an extreme variety of sub-disciplinary interests but it also reviews research grant applications for support by all of the categorical institute programs. Since the latter programs are primarily disease oriented, the Biochemistry Study Section is one of our most important study sections in the basic science areas.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	68	55	81%
May Meeting	99	87	88%
September Meeting	99	89	90%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-4
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Biophysics and Biophysical Chemistry Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in biophysics and biophysical chemistry.
PROJECT TITLE

7. Irvin Fuhr, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Mary Bailey
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

This study section reviews all research grant applications dealing with the application of principles of physics and mathematics to biological problems. Such problems include: (1) the reduction of life processes and activities to physical principles; (2) the use of energy by the cell machinery; (3) the intimate structure, shape, size and composition of complex molecules such as nucleoproteins; (4) the physico-chemical studies of gene, virus, muscle, nerve, and whole organ and body structure and function, etc.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	30	27	90%
May Meeting	30	28	93%
September Meeting	34	29	88%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-5
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Cancer Chemotherapy Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the field of cancer chemotherapy.
PROJECT TITLE

7. Frederick W. Appel, Ph.D.
PRINCIPAL INVESTIGATOR

8. Miss Rena L. Padway
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

This study section was split out of the Pharmacology and Experimental Therapeutics Study Section following the May meeting, holding its first meeting in September. It reviews and evaluates the rapidly growing field of research grant applications concerned with studies of the cure and control of cancer by chemical compounds. Inasmuch as successful cancer chemotherapy implies cytological selection by the compound, it is necessary to study candidate compounds in detail utilizing many disciplinary approaches; otherwise success would by dependent entirely upon hit-or-miss screening tests of candidate compounds. A great deal of scientific ability is necessary on the part of the study section to evaluate the merits of the applications received as well as the abilities of the investigators submitting them. Success in the control of cancer by chemical compounds involves the determination of the compounds of promise, structural alterations as indicated to permit their maximum carcinostatic activity with minimal toxicity to normal tissue, relationships to types and sites of malignant growths and ultimate chemical trials and evaluations.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
September Meeting	65	44	68%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-6
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Cardiovascular Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the field of cardiovascular disease.
PROJECT TITLE

7. Eleanor M. K. Darby, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Katherine P. Lashmit
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Cardiovascular Study Section reviews all research grant applications dealing with cardiac function, the hemodynamics of circulation, the hemodynamic aspects of renal function, hypertension, arteriosclerosis, atherosclerosis and coronary disease. Because of the broad implications in this field as to cause and effect, involving such environmental considerations as dietary factors, physiological and psychological stresses, relationship to other diseases, etc., a broad spectrum of abilities must be represented in the study section to adequately serve the needs.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	34	22	65%
May Meeting	65	46	71%
September Meeting	46	29	63%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-7
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Dental Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in dental research.
PROJECT TITLE

7. R. Donald Reed
PRINCIPAL INVESTIGATOR

8. Mrs. Helen S. Palmer
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Dental Study Section reviews and evaluates research grant applications for the support of research projects concerned with the clinical or basic aspects of oral disease. The etiology and control of diseases of the oral cavity involves a wide range of professional specialties and basic scientific disciplines. Study Section membership is composed of experts in orthodontia, periodontia, prosthodontia as well as specialists in biochemistry, microbiology, pathology, anthropology, and physiology.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	17	7	41%
May Meeting	42	28	67%
September Meeting	53	29	55%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-8
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Endocrinology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant application in endocrinology.
PROJECT TITLE

7. Sam R. Hall, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Patricia S. Hoff
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Endocrinology Study Section reviews and evaluates all research grant applications dealing with basic and clinical studies of endocrine function, including the chemistry of steroid compounds and therapeutic studies involving the use of hormones. The study section has played an important role in the synthesis and standardization of steroid reference substances.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	50	34	68%
May Meeting	122	89	73%
September Meeting	79	57	72%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-9
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Hematology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the field of hematology.
PROJECT TITLE

7. Francis P. McGrath, A.B., M.S.
PRINCIPAL INVESTIGATOR

8. Mrs. Jane V. Jones
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Hematology Study Section reviews and evaluates all research grant applications involving studies on the formed elements of blood, as well as on blood proteins and on diseases involving blood and blood-forming organs. This complex field requires a study section membership oriented primarily toward clinical research but with significant components in basic science disciplines.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	33	17	52%
May Meeting	44	31	70%
September Meeting	48	39	81%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-10
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Hospital Facilities Research Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in development and utilization of hospital facilities.
PROJECT TITLE

7. Glenn G. Lamson, B.A., M.P.H.
PRINCIPAL INVESTIGATOR

8. Miss Marie E. Purdy
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Hospital Facilities Research Study Section was established in 1955 to review applications and encourage research relating to the effective development and utilization of hospital services, facilities, and resources.

The program is designed to aid research, experiments, and demonstrations relating to:

(1) The needs of communities, of the population at large, and of selected groups for hospital and related services.

(2) Measurement of resources available and necessary to meet these needs.

(3) The planning of hospitals and other medical facilities both in relation to community needs and resources, and from an architectural or functional design standpoint.

(4) Methods of increasing the availability and effectiveness of hospital and medical services to the public and of improving the quality and efficiency of hospital and other medical services by clinical, administrative, financial, and educational means.

(5) Methods by which the services of hospitals and other medical facilities can be improved or the cost of such services lowered through coordination of hospitals and other medical facilities with one another on a regional or other basis.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	30	15	50%
May Meeting	30	18	60%
September Meeting	16	8	50%

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-11
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Human Embryology and Development Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications dealing with fertility, reproduction, growth and development.
PROJECT TITLE

7. Samuel Moss, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Miriam S. Frank
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Human Embryology and Development Study Section was created in 1955 to serve a growing need for special competence to review and evaluate research grant applications dealing with various aspects of fertility, reproduction, growth and development. These aspects include the anatomy, histology, histochemistry and pathology of the reproduction organs; the genetic, embryologic and endocrine factors in the physiology of reproduction; the physiological and clinical problems in pregnancy and labor; the perinatal problems of prematurity, postmaturity, fetal physiology, fetal pathology and fetal mortality; and the causes, occurrences and sociologic factors involved in the many types of congenital malformations. From this listing it is obvious that many disciplinary approaches must be welded into an intelligent approach to these very important medical problems.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	46	30	65%
May Meeting	56	42	75%
September Meeting	44	31	70%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-12
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Metabolism and Nutrition Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the fields of metabolism and nutrition.
PROJECT TITLE

7. Edwin L. Hove, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Eunice G. Fasulo
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Metabolism and Nutrition Study Section reviews and evaluates research grant applications proposing to study the biochemical and physiological problems of metabolism and nutrition in which the approach is primarily clinical or biological and in which emphasis is on in vivo rather than in vitro experiments. Such problems are extremely complex due to the interactions of disciplinary interests and require a high degree of professional competence on the part of the study section membership.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	64	47	73%
May Meeting	99	80	81%
September Meeting	90	70	78%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-13
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Microbiology and Immunology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in microbiology.
PROJECT TITLE

7. Berwin A. Cole, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Irene Lindsay
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Microbiology and Immunology Study Section reviews and evaluates applications for research grants in basic studies of bacteriology, virology, rickettsiology, and mycology, and the relation of these etiologic agents to their hosts and other environmental factors. It also reviews applications in certain clinical fields and in immunological responses to infections or vaccines. Because of the highly satisfactory results of the attack upon infectious diseases during the last fifteen years there has been a comparative lull in this highly important field. New technics, such as electron-microscopy and other biophysical approaches, together with newly recognized diseases and organism associations are reviving interest -- and should prove attractive to new investigators. In general, there are many unsolved problems such as control of the common cold and determination of the combination of factors that make pathogens pathogenic.

At the September study section meeting it was decided as necessary to create a new Allergy and Immunology Study Section to better serve these special research areas. The first meeting will be held in January 1957.

The parent section will continue as the Microbiology Study Section.

During 1956 two symposia were sponsored:

"Epidemic Kerotoconjunctivitis and Other Viral Diseases of the Eye" and "Immunology and Cancer"

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	60	46	77%
May Meeting	124	96	77%
September Meeting	115	85	74%

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INDIVIDUAL PROJECT REPORT

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1. DRG-14
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Morphology and Genetics Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in morphology and genetics.
PROJECT TITLE

7. Donald E. Copeland, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. June W. Herman
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OR PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Morphology and Genetics Study Section reviews and evaluates research grant applications dealing with basic biological problems of structure, physiological functions, cytology, genetics and histology and histochemistry where the emphasis is not on pathological aspects. In addition to its review and evaluation of applications, the study section serves as a coordinating body in encouraging research utilizing the electron microscope to study structural relationships and in promoting research in human genetics. A three-day "Conference on Tissue Fine Structure" was held in January, 1956 and attended by more than one hundred researchers. The proceedings of the conference were published as a 429 page supplement to the Journal of Biophysical and Biochemical Cytology, Volume 2, 1956.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	78	66	85%
May Meeting	112	92	82%
September Meeting	95	79	83%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-15
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Neurology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in neurology.
PROJECT TITLE

7. Thomas E. O'Brien, M.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Lottie J. Willard
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Neurology Study Section reviews and evaluates research grant applications for the support of research in diseases of the nervous system, their causes, relationships to other systems and their control. The basic research areas are concerned with neuropathology, cerebral and neurophysiology, neuroanatomy and neuropharmacology. Researches in clinical areas, such as epilepsy, cerebral palsy, paraplegia and neurosurgery are also of considerable interest to the study section.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	29	17	59%
May Meeting	58	36	62%
September Meeting	37	22	59%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-16
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Parasitology and Tropical Medicine Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in parasitology and tropical medicine.
PROJECT TITLE

7. Samuel Abramson, D.V.M.
PRINCIPAL INVESTIGATOR

8. Mrs. Ann H. Martin
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Parasitology and Tropical Medicine Study Section reviews and evaluates research grant applications concerning the biology of protozoa, helminths and insects, certain viruses and rickettsia, and the diseases they transmit or cause. At present, the overwhelming emphasis is upon classical medical zoology, although the study section also reviews such applications as are received in the field of tropical medicine.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	26	17	65%
May Meeting	49	37	76%
September Meeting	42	33	79%

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Part A. Project Description Sheet

1. DRG-17
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Pathology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the field of pathology.
PROJECT TITLE

7. Eli M. Nadel, M.D.
PRINCIPAL INVESTIGATOR

8. Miss Alice M. Farquhar
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Pathology Study Section reviews and evaluates research grant applications dealing with the pathogenesis of disease, with morbid anatomy and histology, and with laboratory diagnosis and forensic medicine. Particular emphasis is placed upon experimental pathology, or the study of artifically induced disease processes, as compared to the classical aspects of clinical pathology. The study section has been particularly active in the promotion of research training, utilizing the existing training programs where they exist and encouraging the incorporation of research training features in research grants where feasible. It is concerned particularly with the future needs in the fields of pathology and has provided stimulation to workers in these and related fields.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	41	32	78%
May Meeting	80	59	73%
September Meeting	75	64	85%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-18
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Pharmacology and Experimental Therapeutics Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in pharmacology and experimental therapeutics.
PROJECT TITLE

7. J. Palmer Saunders, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Eilleen G. English
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Pharmacology and Experimental Therapeutics Study Section reviews and evaluates research grant applications dealing with the preparation, isolation and identification of compounds of pharmacologic interest, either as therapeutic compounds or toxicants, with the metabolism of therapeutic agents or toxicants and the relation of chemical constitution to activity, and with the mechanisms, sites and effects of drug and toxicant actions. Following the May meeting the cadre of members from this study section was transferred to the new Cancer Chemotherapy Study Section where, after the addition of other specialists, research grant applications in the field of cancer chemotherapy were reviewed at the September meeting. Additional members were also added to the Pharmacology and Experimental Therapeutics Study Section to replace those transferred.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	78	55	71%
May Meeting	134	99	74%
September Meeting	55	34	62%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-19
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Physiology Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in physiology
PROJECT TITLE

7. Clara E. Hamilton, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Alma D. McGirk
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Physiology Study Section reviews and evaluates research grant applications concerned with the basic functioning of organs and organ systems, comparative physiology, and basic physiological principles (general physiology). In general, clinical studies are not included, but studies on the effect of environmental agents on the functioning of organs and organ systems are appropriate. In those instances where other study section interests overlap (e.g. Cardiovascular, Neurology) with those of the Physiology Study Section, only those applications dealing with basic problems of normal function are appropriate for the Physiology Study Section.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	43	35	81%
May Meeting	85	75	88%
September Meeting	72	56	78%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-20
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Public Health and Nursing Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in the fields of public health and nursing research.
PROJECT TITLE

7. Eleanor M. K. Darby, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Esther Fink
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).
Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Public Health and Nursing Study Section reviews and evaluates research grant applications dealing with problems of general public health and nursing service research significance. Such problems as medical and nursing education, medical and nursing care, public health practice, public health administration, morbidity, mortality and status of health surveys, problems of population and community health, preventive medicine, and field studies of the effectiveness of diagnostic, prophylactic and therapeutic procedures come to this broadly oriented study section.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	21	8	38%
May Meeting	35	16	46%
September Meeting	40	12	30%

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1. DRG-21
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Radiation Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in field of radiation.
PROJECT TITLE

7. Irving Gerring, B.S., M.S.P.H.
PRINCIPAL INVESTIGATOR

8. Mrs. Florence E. LePere
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Radiation Study Section is an outgrowth of the Committee on Radiation Studies and held its first meeting in May 1955. It reviews and evaluates research grant applications in which problems of radiation or due to radiation are paramount rather than those in which established radiation procedures are used in more or less routine manner. Two subcommittees of the study section have been established, one to develop a conference on the general subject of therapeutic radiology and the second to analyze methods for developing studies to determine the possible hazards of x-ray diagnosis and therapy. The study section as a whole is concerned with the problem of radioactive fallout and liaison is maintained with other agencies of the Service and the Government in all aspects.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	17	14	82%
May Meeting	32	18	56%
September Meeting	22	17	77%

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Part A. Project Description Sheet

1. DRG-22
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Sanitary Engineering and Occupational Health Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in sanitary engineering and occupational health.
PROJECT TITLE

7. Irving Gerring, B.S., M.S.P.H.
PRINCIPAL INVESTIGATOR

8. Mrs. Florence E. LePere
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Sanitary Engineering and Occupational Health Study Section reviews and evaluates research grant applications in the fields of sanitary engineering, environmental sanitation, the hygiene of housing and of industry, and such multidisciplinary fields as atmospheric and water pollution, and of food technology. The section is also concerned and active in meeting the problems in training engineers, physicians and other scientists in occupational health. Although liaison is maintained with many interested Federal and nonfederal agencies, particularly close working relationships are maintained with the Division of Sanitary Engineering, the Division of Special Health Services and the Robert A. Taft Sanitary Engineering Center of the Bureau of State Services.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	43	24	56%
May Meeting	72	44	61%
September Meeting	40	25	62%

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Part A. Project Description Sheet

1. DRG-23
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Sensory Diseases Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grant applications in sensory diseases.
PROJECT TITLE

7. Thomas E. O'Brien, M.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Lottie J. Willard
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OR PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Sensory Diseases Study Section complements the actions of the Neurology Study Section in reviewing and evaluating research grant applications dealing specifically with clinical research in diseases and abnormalities in ophthalmology, otolaryngology, speech and hearing rehabilitation, etc. Basic studies relating to these clinical problems are also reviewed, such as in ocular and otologic physiology in health and disease, anatomy and histology of sense organs, sense organ injury and rehabilitation and psychophysiology and psychoacoustics.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	26	17	65%
May Meeting	40	37	92%
September Meeting	36	32	89%

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Part A. Project Description Sheet

1. DRG-24
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Surgery Study Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research grants in surgery.
PROJECT TITLE

7. Harris Levin, M.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Anna Marie Stiles
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Surgery Study Section reviews and evaluates research grant applications in a wide variety of problems in surgery and surgery-related fields. Among the most common subjects of research are anesthesia, gastroenterology urology, orthopedics, wound healing, burns, cancer etiology and therapy, shock and cardiovascular diseases. The section is also concerned with experimental surgery research, particularly as it applies to the abnormal pathology and physiology of diseases treated surgically, and with the systemic reactions to such treatment, as well as to develop new surgical technics and treatments. Current emphasis is found in cardiovascular surgery including vascular grafts, myocardial revascularization, repairs of heart lesions and heart by-pass procedures with or without pump oxygenators.

STUDY SECTION ACTIONS, CY 1956

	Projects Reviewed	Projects Approved	Approval Rate
January Meeting	46	21	45%
May Meeting	60	39	65%
September Meeting	75	48	64%

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-25
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Committee on Standards for Grants Surveys
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Reviews and evaluates research grant applications to which the Federal Reports Act applies.
PROJECT TITLE

7. Emmarie C. Hemphill, A.B., M.A., M.P.H.
PRINCIPAL INVESTIGATOR

8. Mrs. Mercy A. Collingwood
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

This committee assumes the responsibilities of the Office of Statistical Standards of the Bureau of the Budget as they relate to the review of Public Health Service grants which fall under the purview of Circular A-40 - clearance of plans and report forms under the Federal Reports Act.

The following types of applications fall within the group that requires special handling by the committee:

1) Large scale surveys of health status or medical care, including related socio-economic factors;

2) Large scale surveys of attitudes, opinions, or information;

3) Large scale surveys of health or medical facilities, or of educational or research facilities related to health;

4) Any surveys which might unreasonably overburden the same respondents.

Excluded from special handling by the committee:

1) Applications involving survey or statistical methods such as are ordinarily carried out in connection with laboratory and clinical problems of the etiology, pathogenesis, diagnosis, prevention, treatment, epidemiology,

and prognosis of the physical and mental diseases and impairments of man, where such studies are limited to population groups within institutions such as universities, laboratories, hospitals, clinics, orphanages, sanatoriums, public health agencies, and other like institutions, or the private medical practices of the group of investigators;

2) Surveys which might fall under categories 1 through 4 above but which are aimed primarily at the development of research methodology, except where they are very large.

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Part A. Project Description Sheet

1. DRG-26
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Advisory Committee on Epidemiology and Biometry
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and evaluation of research and research training grant applications involving the use of or training in epidemiological & biometrical procedures.
PROJECT TITLE

7. Murray Goldstein, D.O.
PRINCIPAL INVESTIGATOR

8. Emmarie C. Hemphill, A.B, M.A., M.P.H.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Advisory Committee on Epidemiology and Biometry was established by the Division of Research Grants late in 1956 to help discharge the Division's newly assumed responsibility for the unified administration of grant programs for the training of epidemiologists and biometricians. The Committee is composed of eleven outside experts, four Service representatives, and liaison representatives from each of the Institutes. One organizational meeting was held in December 1956.

The duties of the Committee have been outlined as follows:

1. Survey the status of research training in epidemiology and biometry in the country.
2. Advise on how programs can best be stimulated in the field of training in epidemiology and biometry.
3. Review applications for training grants in these fields.

4. Act as advisers and consultants to Study Sections of NIH on any pending applications involving epidemiology and biometry.

5. Serve as special resource to the NIH for the development and operation of programs of epidemiology and biometry within the Public Health Service.

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-27
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Grants Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Program Analysis Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Indexing reports and publications resulting from Public Health Service supported research and providing a wide variety of information concerning research programs.
PROJECT TITLE

7. Lynda L. Cahoon, B.A.
PRINCIPAL INVESTIGATOR

8. William J. Holliman, Jr., and Allan Hough
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Program Analysis Section of the Division of Research Grants indexes reports and publications resulting from Public Health Service-supported research, including publications from National Institutes of Health scientists.

The services of the Program Analysis Section are available to aid administrative personnel in answering inquiries regarding the achievements of such Public Health Service-sponsored research and the nature and extent of these investigations; and to research personnel interested in the various facets of scientific endeavors of workers in their own and related fields.

Since the Section was established three years ago, over 32,000 documents, representing all available publications received since the inception of the PHS grants program, have been processed. Documents are indexed according to a system which employs descriptive single words or logical combinations of words rather than predetermined categorizations. Each document is identified by an average of twenty terms. The basic vocabulary for this library of documents now totals approximately 20,000 alphabetical cards, containing numbered references

to the documents in which the term appears. The vocabulary is expandable as new concepts occur. The original documents are filed in the Section and are available for administrative use on a loan basis. Bibliographic lists of grantee-publications also can be furnished.

Although the majority of the work of the Section during the year 1956 has been involved in indexing and processing the backlog of accumulated documents and attempting to keep current the more than 5,000 reports and publications received during the year, the Section has been able to answer over 100 inquiries pertaining to PHS-sponsored scientific research. The inquiries varied in complexity from specific requests which could be answered immediately; e.g., the names of investigators doing Leptospira studies, to the more general questions such as one asking for names of workers involved in bacterial, viruses, rickettsiae and fungi research, the answer to which resulted in a 160-page compilation. The majority of inquiries during the past year have been of the more involved type. In general, the more specific the nature of the inquiry, the more readily accessible is the indexed information.

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October 1956
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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-28
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Administration of the Research Fellowships Branch
PROJECT TITLE

7. Ronald E. Scantlebury, Ph.D.
PRINCIPAL INVESTIGATOR

8. Stephen P. Hatchett, Ph.D.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Office of the Chief is responsible for coordination of the sixteen programs operated in the Research Fellowships Branch, Division of Research Grants.

The Central Qualifications Board meets monthly to discuss standards for evaluation of Fellowships, procedures and practices, as these affect the operation of all programs. Certain applications are considered by this Board to determine (1) whether it falls within the definition of a research fellowship as defined by policy, regulations and standards, and (2) recommends stipends for Special Fellowship applicants. The Chief of the Branch is Chairman of this Board.

All information for Congressional Committees, Bureau of the Budget, Public Health Service officials and the various Institutes is coordinated in this office.

During the current year, emphasis has been placed on an overall program analysis from the beginning of operations in 1946 through 1956. These

analyses have been prepared showing department and field of study, geographical location, advanced degrees earned and types of postdoctoral training, and the number of awards and amount of funds expended annually for each Institute.

A total of 3,005 fellowship applications (including regular, senior, and part-time) amounting to $9,964,366.00 were received. Graduate nursing training grant applications were received from 56 schools of nursing, representing 553 trainees, amounting to $2,000,000.00.

The stipends for Full-time Fellowships were increased to bring them more in line with those of other granting agencies. The new stipends are:

Predoctoral Research Fellows	
First Year	$1,600
Intermediate	1,800
Terminal	2,000
Postdoctoral Research Fellows	
First Year	$3,800
Second Year	4,200
Third Year	4,600

Dependency allowances, travel, and supply grants remain at their former level.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRG-28
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$51,420	($132,880) *	$184,300	4	26.9	30.9

* Reimbursement from all Institute R&A Activities.

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	4	31	35	

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☒
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO.(S):

All NIH Institutes Review and Approval activities

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-29
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OF DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of research fellowship applications assigned to the National Institute of Arthritis & Metabolic Diseases Specialty Fellowships Board.
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

Fellowships are awarded for research training with special emphasis on arthritis and metabolic diseases. These awards are made upon recommendation of a Specialty Fellowships Board composed of employees of the National Institute of Arthritis and Metabolic Diseases. Because of the special interest of this Institute most awards are made on the postdoctoral and special levels. Emphasis is on clinical research. Appointments for 1956 were made as follows:

	Number	Amount
Predoctoral	19	$ 45,384
Postdoctoral	46	175,818
Special	6	39,642
Supply Grants		3,750
Total	71	$264,594

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-30
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of research fellowship applications assigned to the National Institute of Neurological Diseases & Blindness Specialty Board.
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Specialty Fellowships Board of the National Institute of Neurological Diseases and Blindness reviews applications for basic and clinical research training in neurology and blindness. Special emphasis is placed on the basic and clinical training for personnel to study the blinding eye diseases.

Appointments for 1956 were:

	Number	Amount
Predoctoral	27	$ 60,632
Postdoctoral	37	152,152
Special	4	17,462
Part-time	154	90,720
Supply Grants		5,750
Total	222	$326,716

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-31
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of research fellowship applications assigned to National Cancer Institute Specialty Fellowship Board.
PROJECT TITLE

7. Stephen P. Hatchett, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

Because of the broad implications of cancer, the Specialty Board of this Institute recommends fellowship appointments for study in the broad and varied fields related to cancer including genetics, cellular biology, virology related to cancer, and clinical research.

During 1956 the Fellowships were granted to:

	Number	Amount
Predoctoral	157	$361,590
Postdoctoral	111	451,475
Special	19	102,188
Part-time	25	74,096
Supply Grants		26,057
Total	312	$1,015,406

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-32
SERIAL NUMBER

2. Division of Research Grants
INSITUTE OF DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of research fellowship applications assigned to the National Institute of Dental Research Specialty Fellowship Board.
PROJECT TITLE

7. Stephen P. Hatchett, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Specialty Fellowship Board of the National Institute of Dental Research recommends for fellowship appointments not only applicants desiring to train in dental research laboratories but in such other fields as nutrition, endocrinology, physiology and microbiology when research is related to current problems in dentistry.

During 1956 the fellowships awarded were distributed as follows:

	Number		Amount
Predoctoral	6		$ 16,704
Postdoctoral	25		118,270
Special	4		22,450
Part-time	223		119,968
		Supply Grants	1,500
	258		$278,892

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-33
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of applications for research fellowships assigned to the National Institute of Allergy and Infectious Diseases Specialty Fellowship Board.
PROJECT TITLE

7. Stephen P. Hatchett, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During 1956 the National Microbiological Institute became the National Institute of Allergy and Infectious Diseases. This reorientation is as yet not clearly reflected in the fellowship awards made by this Institute. Fellowships were sponsored in the broad fields comprising microbiology as well as in related areas of serology, biochemistry, immunology and chemotherapy.

The fellowship awards made during 1956 by the Institute divide into the categories listed below:

	Number		Amount
Predoctoral	26		$ 70,091
Postdoctoral	10		44,436
Special	2		5,225
		Supply Grants	1,500
Total	38		$121,252

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-34
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of applications for research fellowships assigned to the Division of Research Grants.
PROJECT TITLE

7. Ronald E. Scantlebury, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The research fellowships of the Division of Research Grants are awarded to train personnel in basic medical research, and to develop research workers in new areas. To the latter end, the emphasis, in 1956, has been placed on training Sanitary Engineers specializing in health problems related to air and water pollution. The emphasis on the training of workers in dermatology and pathology continues.

In 1956, the following awards were made by the Division of Research Grants:

	Number		Amount
Predoctoral	14		$ 34,653
Postdoctoral	23		87,602
Special	32		118,981
Senior	44		485,409
Part-time	417		228,600
		Supply Grants	4,000
Total			$959,245

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-35
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of applications for research fellowships assigned to the National Heart Institute.
PROJECT TITLE

7. Ronald E. Scantlebury, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The program administered for the National Heart Institute shows special interest in training personnel to meet the varying needs of research directed to discovering the cause and cure or alleviation of heart diseases and circulatory conditions. The Specialty Fellowship Board of this Institute puts special emphasis on programming and advanced planning especially in areas of epidemiology to determine the incidence of these afflictions, development of new instruments to study heart and circulatory diseases as well as providing personnel to carry out research using newly developed ideas as they arise. Some emphasis is placed on training accomplished research workers in interdisciplinary areas to provide new leadership to use new techniques and apply these to research in heart disease.

During 1956 the following awards were made:

	Number		Amount
Predoctoral	92		$ 223,343
Postdoctoral	187		795,254
Special	42		213,884
Part-time	77		36,528
		Supply Grants	27,083
Total			$1,296,092

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-36
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of applications for research fellowships assigned to the National Institute of Mental Health Specialty Fellowship Board.
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

Research fellowships are awarded for the purpose of providing research training in mental health and allied areas. During 1956 a total of 109 predoctoral and postdoctoral fellowships were awarded through the National Institute of Mental Health, encouraging research in many important areas broadly related to mental health, as well as to closely allied fields. These included such areas as Family Relations, Beliomoral Sciences, Gerontology, Alcoholic Studies, Child Study and Guidance. Awards are listed below:

	Number	Amount
Predoctoral	61	$151,221
Postdoctoral	48	201,634
Special	none	none
	Supply Grants	8,138
Total	109	$360,993

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-37
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of applications for research fellowships assigned to the Division of Nursing Resources Specialty Fellowship Board.
PROJECT TITLE

7. Ronald E. Scantlebury, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

Part of the Division of Research Grants funds is set aside for developing personnel in the much needed field of research in nursing. This program is in its second year. Emphasis is placed on providing training in techniques of research in nursing care and nursing education. Support is provided not only for those attending graduate schools of nursing but also in such ancillary departments as statistics, social research, etc., and on-the-job training where research projects emphasize nursing problems. In 1956, the following awards were made:

	Number	Amount
Special	10	$35,183
Part-time	62	26,784
Total		$61,967

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-38
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Student Part-time Medical Research Fellowships
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During the year 1956, the Medical Student Part-time Research Fellowship program has provided research experience for a total of 583 students in 83 schools of Medicine and Osteopathy. A total of $390,280 was expended for this purpose. During this year the Surgeon General approved an increase of $200 for each fellowship unit, raising the amount from $400 to $600. Notice of this increase resulted in a most appreciative response from the Deans and Sponsors. Medical schools are entitled to apply for 8 units at $600 each, plus 8% overhead. The unsolicited comments below are quoted from the many letters received from deans and are indicative of the student interest in basic research which this program engenders:

"We feel that the opportunities afforded the students through these fellowships are invaluable in encouraging and fostering an academic interest in research. The fact that several of our students are now undertaking part-time graduate work in the basic science fields here is gratifying evidence that such awards as these are providing the stimulus."

"I think this program is achieving what it set out to do. We are very pleased with it."

"In my opinion, this is a most successful program and you should be congratulated for raising the number to eight this coming year. I hope this program can continue to grow."

"This has been a most effective way for interesting students in research. In a number of instances students supported by this program have continued working in the department beyond the period during which they received funds. I sincerely hope that it is possible to continue this program."

"The administration of the school is grateful for the assistance given the students during the summer just past and in previous years. We appreciate being enabled further to nurture research interests and to encourage the sort of development in students which seems impossible except by way of actual research activity."

"On the whole our staff and administration is most enthusiastic about the Medical Student Part-time Research Fellowships. We feel that this is one of the best ways to improve the growth in depth of our medical students. There has also been demonstrated that this program is an excellent way to interesting outstanding medical students for possible academic careers."

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-39
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Student Part-time Nursing Research Fellowships.
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During the year 1956, the Nursing Student Part-time Research Fellowship Program has provided research experience for a total of 62 students in 16 schools of Nursing. A total of $26,784 was expended for this purpose. During this year the Surgeon General approved an increase of $200 for each fellowship unit, raising the amount from $400 to $600. Notice of this increase resulted in a most appreciative response from the Deans and Sponsors. Nursing schools are entitled to apply for 4 units at $600 each, plus 8% overhead. The unsolicited comments below are quoted from letters received and show the appreciation of the Nursing Schools for this program:

"This support will indeed be most helpful to us in giving nursing students an opportunity to engage in research projects."

"We greatly appreciate this support and believe that it will be helpful to such nursing students who are interested in the research field."

"I am sure these funds will go far toward stimulating graduate students to explore and develop their potentialities for research in nursing."

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-40
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Student Part-time Public Health Research Fellowships.
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During the year 1956 the Public Health Student Part-time Research Fellowship Program has provided research experience for a total of 28 students in 7 Schools of Public Health. A total of $12,880 was expended for this purpose.

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Part A. Project Description Sheet

1. DRG-41
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5. ____
LOCATION (IF OTHER THAN BETHESDA)

6. Student Part-time Dental Research Fellowships
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8. ____
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During the year 1956 the Dental Student Part-time Research Fellowship Program has provided research experience for a total of 223 students in 38 Schools of Dentistry. A total of $119,968 was expended for this purpose. During this year the Surgeon General approved an increase of $200 for each fellowship unit, raising the amount from $400 to $600. Notice of this increase resulted in a most appreciative response from the Deans and Sponsors. Dental schools are entitled to apply for six units at $600 each, plus 8% overhead. The unsolicited comments below are quoted from the many letters received from deans and are indicative of the student interest in basic research which this program engenders:

"In my opinion, these undergraduate fellowships are one of the most important parts of the recruitment and procurement program for research and faculty personnel."

"It is also very interesting to note the deep interest in research developing among the students participating in the program."

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INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-41
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Student Part-time Dental Research Fellowships
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

During the year 1956 the Dental Student Part-time Research Fellowship Program has provided research experience for a total of 223 students in 38 Schools of Dentistry. A total of $119,968 was expended for this purpose. During this year the Surgeon General approved an increase of $200 for each fellowship unit, raising the amount from $400 to $600. Notice of this increase resulted in a most appreciative response from the Deans and Sponsors. Dental schools are entitled to apply for six units at $600 each, plus 8% overhead. The unsolicited comments below are quoted from the many letters received from deans and are indicative of the student interest in basic research which this program engenders:

"In my opinion, these undergraduate fellowships are one of the most important parts of the recruitment and procurement program for research and faculty personnel."

"It is also very interesting to note the deep interest in research developing among the students participating in the program."

Student Part-time Dental Research Fellowships (cont'd.)

"We have found these fellowships to be very valuable in encouraging students to do research and also to give them a better insight of the basic research problems as they pertain to dentistry."

"It is my impression that the Dental Student Part-time Research Fellowships serve a very useful purpose. The interest expressed by our students for these fellowships is increasing every year. I feel certain that most of the students I have worked with under this arrangement will be interested in continued research activity in connection with graduate work."

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October 1956
(Attachment I)

Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-42
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Fellowships Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Review and approval of Senior Research Fellowships.
PROJECT TITLE

7. Mrs. Catherine E. Cantrell
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

In an effort to meet the increasing shortage of teachers and researchers in the preclinical fields, the 84th Congress appropriated $500,000 to be made available to medical schools, dental schools, and schools of public health to recruit and support qualified persons in the field of the preclinical sciences until they have reached a degree of maturity to enable them to assume tenure positions, or their equivalent, or become independent investigators with assurance of stable support. For this program the preclinical sciences were defined to include anatomy, behavioral sciences, biochemistry, biophysics, biostatistics, genetics, microbiology, pathology, pharmacology, and physiology. The program covers a five-year period, with a $500,000 increase in funds proposed for each of the years up to $2,500,000 in the fifth year with an estimated total of 250 awards. An essential of the program is that these awards not replace school funds, but that they add to them. The maximum salary allowance is $10,000, but must be consistent with the school policies, together with $2,000 for partial research expense.

A Selection Committee for Senior Research Fellowships was appointed by the Surgeon General and held its first meeting October 5, 6, and 7, 1956, to consider the 107 applications received. Forty-four were approved for a five-year period, and submitted to the National Advisory Health Council for recommendation to the Surgeon General. The disciplines represented by these awards, together with the money, are shown below:

Anatomy	6	$66,290.00
Behavioral Sciences	1	10,550.00
Biochemistry	9	96,464.00
Microbiology	6	63,427.00
Pathology	12	129,221.00
Pharmacology	8	89,715.00
Physiology	1	8,786.00
Epidemiology	1	10,956.00
Total	44	$475,409.00

At the end of the five-year period, a report will be made to Congress on which it will base its decision whether to continue the appropriation and whether additional funds can be used to increase the number of individuals to be supported.

Responses to Letters of Award have been received from schools indicating enthusiasm for the program and for the opportunity it presents to correct the serious lack of teaching personnel in the areas represented by the program.

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October 1956
(Attachment I)

Calendar Year 1956

PUBLIC HEALTH SERVICE -- NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-43
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Operation of the Graduate Nurse Traineeship Program, Title II, P.L.911 for Division of Nursing Resources, Bureau of Medical Services
PROJECT TITLE

7. Katherine S. Wilson, Ph.D.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):
In the first year of this program 553 traineeships were awarded to 56 participating schools for the purpose of providing advanced training for teaching, supervision and administration in nursing schools and hospitals. The program has had a very warm reception. During the first year the schools awarded a substantial number of traineeships to qualified applicants who could complete their training in a short period of time and thus become eligible to assume higher level positions. It is anticipated that the number of short term trainees will decrease as the program matures.

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(Attachment I)

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-44
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowship Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Visiting Scientist Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Visiting Scientist Program
PROJECT TITLE

7. Stephen P. Hatchett, Ph.D.
PRINCIPAL INVESTIGATOR

8. Mrs. Mary E. Behrens
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

A program designed to bring outstanding scientists, both citizens and non-citizens to the National Institutes of Health, is operated for all Institutes. The function of the Branch is to handle details of appointment including clearance through the Department of State and the Office of Immigration and Naturalization for non-citizens.

During 1956 appointments were made as follows:

Institute	On Duty	Pending	Withdrawn
NIAMD	15	3	1
NINDB	22	2	1
NCI	17	3	3
NIDR	2		
NIAID	2		
NHI	11	2	
NIMH	10	3	
CC	1		
Totals	80	13	5

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October 1956
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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-45
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Research Fellowships Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Management Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Management Section, Research Fellowships Branch
PROJECT TITLE

7. Mrs. Lillian M. Rankin
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Management Section of the Research Fellowships Branch provided a control system to insure the proper processing and presentation of approximately 2,000 applications for regular research fellowships to the Central Qualifications Board and the several Specialty Fellowship Boards.

Upon recommendation of the Boards, prepared Statement of Research Fellowship Awards and encumbering documents for 998 successful applicants, and upon their "entering on duty," processed the papers necessary for placing on payroll.

Maintained fiscal control records for information and guidance of Chief, Assistant Chief, Board Secretaries, and Grants Branch Chiefs.

Provided reports on various phases of the research fellowships program for the use of the several Institutes, ie.:

(a) fellowship applications received during a given period.
(b) fellowships awarded and funds encumbered during a given period.
(c) fellows on duty at certain institutions.
(d) fellows on duty in certain research fields.

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Calendar Year 1956

PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-46
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Health Research Facilities Branch
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Providing staff services and coordination to the National Advisory Council on Health Research Facilities in the review and approval of health research facilities construction grants.

7. Francis L. Schmehl, B.S., M.S.
PRINCIPAL INVESTIGATOR

8. Mr. James H. LeVan, Dr. Harvey I. Scudder, Miss Wilma L. Aber and Miss Vera Churchill
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Health Research Facilities Branch was established July 30, 1956, to execute a construction grant program newly authorized under Public Law 835 (84th Congress, 2nd Session). This law became amended Title VII of the Public Health Service Act, and provided for health research facilities construction grants in the amount of $30 million per year for three years. The law established a twelve-man National Advisory Council on Health Research Facilities, with the Surgeon General as Chairman and a representative of the National Science Foundation, both as ex-officio members.

The Branch was staffed and operating by early August 1956, and soon sent out approximately 2,000 notices of the new program using a variety of mailing lists of institutions and individuals.

Application forms and processing procedures were formulated by the new Branch, and in response to requests, well over 300 applications had been mailed to institutions at the time of the first meeting of the National

Advisory Council on September 24-25, 1956. At this meeting thirty one completed applications were presented to the National Advisory Council on Health Research Facilities. The Council recommended only seven of the more urgent requests and deferred until its December 3-5, 1956, meeting the remaining applications to permit project-site visits and to obtain more adequate information as to the broad needs of the program throughout the Country. The Surgeon General has approved these seven recommended applications and the applicants are being paid their respective grants.

At their first meeting the Council also conferred with the Surgeon General on a draft of program regulations as required in Sec. 709 of P.L. 835. These regulations were drawn up in final form, submitted by the Surgeon General, approved by the Secretary, and published in the Federal Register on October 3, 1956 (21 Federal Register 7567).

During the interval between the September and December 1956 Council meetings, "teams" of Council members, each with a staff assistant, have made 54 project site visits which have, without exception, elicited complete cooperation of the applicant institutions in setting forth their plans and problems in detail. This interval also provided opportunity for adequate study of additional applications submitted prior to the December meeting.

At the time of the December 3-5, 1956, meeting of the Council, there were pending 129 formal research grant applications in the total amount of $66,046,507. The Council deferred or disapproved 56 applications in the total amount of $27,102,305. The Council did recommend 73 applications for payment from fiscal year 1957 funds in the total amount of $24,460,467.

As of the closing date of this report, December 31, 1956, 140 institutions have formally applied for research construction grants and 88 more have officially indicated their intention of so doing. The total demand for Federal Funds by these 228 institutions is now $116,620,214, but this figure is expected to rise very significantly as additional research construction grant needs are presented by 321 other institutions holding application, but which have not yet applied or indicated their intentions.

In view of the overwhelming demand for funds under this program, the National Advisory Council on Health Research Facilities recommended, within available funds, such grants or portions of grants as would get actual construction started, and deferred until a later meeting the requests for movable equipment which could not be placed until construction was completed.

Since the funds presently available are not adequate to provide for more than a portion of meritorious applications, the Council is retaining for further study and subsequent action those applications or portions of applications on which it found necessary to defer action at its December 1956 meeting. These deferrals were based either on the movable equipment items or need for further Council study (including project site visits). The Council has scheduled additional meetings with respect to this fiscal year, i.e., March 18-20, and May 27-29, 1957.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRG-46
SERIAL NUMBER

12. **BUDGET DATA:**

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$200,000	--	$200,000	4	13.2	17.2

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	4	13	17	--

13. **BUDGET ACTIVITY:**

RESEARCH ☐
REVIEW & APPROVAL ☒
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO.(S):

None

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Calendar Year 1956

PUBLIC HEALTH SERVICE -- NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRG-47
SERIAL NUMBER

2. Division of Research Grants
INSTITUTE OR DIVISION

3. Operations Branch
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. NIH Extramural-Programs Service Unit
PROJECT TITLE

7. Clarence A. Lowe
PRINCIPAL INVESTIGATOR

8. Gilbert J. Frey and Robert L. Weber
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

Not applicable.

10. PROJECT DESCRIPTION (SEE INSTRUCTIONS):

The Operations Branch of the Division of Research Grants consists of various service-type sections and units performing functions that are required by all of the NIH and several PHS grant and award activities. These central functions include the processing of research grant and fellowships applications, duplicating of the required copies for review purposes, payment of successful applications, administration of grant projects during their active life, development and maintenance of records for all extramural programs, and finally, the auditing and closing of terminated grant projects. In addition, various units within the Branch are responsible for the day-to-day operation of the Division, such as mail and files, personnel recruitment, budgetary and financial planning, purchase and supply planning and procurement, Division travel requirements, space management, and custodial and maintenance responsibilities.

The Duplicating Unit, in addition to accomplishing its originally planned function of providing multiple copies of extramural grant and award applications, further serves as the official NIH Class-A printing plant.

The objective of this branch is one of maximum production at a minimum of cost, and can be compared to an assembly line type of operation. Each of the many steps encountered between receipt of applications and final actions by the Advisory Councils and the Surgeon General, must be closely coordinated to eliminate the development of bottlenecks in the review and approval process.

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PUBLIC HEALTH SERVICE - - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B. Budget Data

11. DRG-47
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$126,750	($327,550*)	$454,300	--	62.9	62.9

*Reimbursement from all NIH Institute R&A activities.

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	—	88	88	--

13. BUDGET ACTIVITY:

RESEARCH ☐
REVIEW & APPROVAL ☒
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO.(S):

All NIH Institutes review and approval activities.

DIVISION
OF
RESEARCH
SERVICES

DIVISION OF RESEARCH SERVICES

Analysis of Program Activities--1956

Organization

The Division of Research Services, established in 1955, was actively operating at the beginning of Calendar 1956. At that time, the Division comprised five Branches: Plant Engineering, Scientific Reports, Laboratory Aids, Biometrics, and Sanitary Engineering. A sixth Branch, Research Facilities Planning, was activated on October 1, 1956.

DRS was organized for the purpose of centralizing and broadening services in support of research, in order to meet the needs of an expanding NIH program.

Through its six Branches, the Division provides scientific, technical and engineering aid to the entire National Institutes of Health.

Major DRS Activities, 1956

Operation and maintenance of the entire NIH complex of buildings and grounds.

Design, engineering, and construction in the extensive NIH building and remodeling program.

Establishment of a translating service for dissemination of Russian publications in the biological and medical sciences.

Increased production of laboratory animals and media for NIH use.

Establishment of a facility for producing germ-free animals.

Design and development of a central disposal facility for waste chemicals.

Programing for the installation and use of electronic data-processing equipment.

Services in the fields of biometrics, instrumentation, photography, medical art, sanitary engineering; and library, translating, and editorial services for all of NIH.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-1
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3.
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief, DRS
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO.(S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

See preceding statement by the Chief, DRS, and reports from the six DRS branches.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-1
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

See reports from the six DRS branches.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

See reports from the six DRS branches.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-2
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Plant Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. All Sections
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. R. R. Holliday, ~~Acting~~ Chief, Plant Engineering Branch
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

The Plant Engineering Branch is organized to provide three major central services to all NIH Institutes and Divisions:

Operation and maintenance of buildings and grounds.

Professional engineering service in the design of new facilities for research and related programs.

Construction services in the many mechanical, electrical, and architectural operations involved in the building or alteration of facilities.

Reorganization

An increasing workload created by the new building program necessitated internal DRS reorganization, resulting in the establishment (October 1956) of the Research Facilities Planning Branch. To staff the new Branch and the Office of the Chief, DRS, the following personnel changes were made. The Chief of the Plant Engineering Branch was reassigned to the Office of the Chief, DRS; the Assistant Chief, PEB, was assigned as Acting Chief, RFPB; and, the Chief, Mechanical Engineering Section, PEB, was assigned as Chief, PEB.

A study is being made of the PEB organization in order to maintain organizational structure and staffing commensurate with expanding needs.

Accomplishments

Completed approximately 550 projects requiring a significant amount of design preliminary to contracting for or performing work in the areas represented by the seven major craft shops of the Plant Engineering Branch: plumbing, electrical, air conditioning and heating, metal, carpentry, painting, and automotive garage.

The seven major craft shops completed approximately 30,000 service requests during 1956. Major projects included the remodeling of 31 laboratories and 2 1/2 entire floors of NIH buildings; installing a new still and distribution system; installing an interoffice communications system; installing facilities for metallizing cages; installing a large dehydrating unit; altering laboratory electrical units to grounded type; installing air conditioning units and special equipment; and painting as required throughout NIH.

Problems

Problems inherent in the expansion of NIH facilities during 1956 handicapped PEB in several areas.

Employment of professional engineering personnel required in management and technology was extremely difficult. Vacancies created an overload for the staff on duty and a backlog of uncompleted work.

Budget problems arose because of the difficulty of forecasting needs. Many of these needs were not foreseeable at the time budget

forecasts were made. A firm policy for establishing budget responsibility for PEB functions is now under study.

Adequate and properly located offices and storage space for construction materials have not been available as a result of the shortage of office space at NIH. It is hoped that the situation will be relieved by new construction now being planned.

Increasing numbers of requests for service resulted in the organization (October 1956) of the "Project Control Office," now operating in the Office of the Chief, PEB.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-2
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

During the year awards were presented to three Plant Engineering Branch employees. Mr. Harry McGahren, Chief, Grounds Maintenance and Landscape Section was recognized for Superior Work Performance. Mr. Laurence Northcutt received an award for development of a control panel used for training and "trouble shooting" in heating and air conditioning system controls. Mr. Edward Osborn received an award for development of a modulating valve mechanism.

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October 1956

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-3
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Scientific Reports Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. All Sections
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. Taft S. Feiman, Chief, Scientific Reports Branch
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL! FACILITIES OR FUNDS)! IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

To provide the entire NIH with supportive services in the areas represented by the six SRB Sections: Library (including Translating Unit), Editorial, Photography, Medical Arts, Publications and Reports, and Special Events.

Office of the Chief, SRB

On December 17, 1956, Mr. Taft S. Feiman, former Managing Editor of Public Health Reports, PHS, became the Chief, SRB. Prior to Mr. Feiman's appointment, Mr. John E. Fletcher, Chief, Office of Research Information, OD-NIH, served as Acting Chief, SRB.

Accomplishments

Library

The Processing Unit acquired, organized, and made available 2,659 new volumes and 48,274 serials, and filed a total of 24,119 catalog cards.

The Reference Unit, providing information service, answered 1,597 questions of fact (ready reference), and prepared replies to an additional 1,521 extended search questions such as reading lists, bibliographies, and interpretations of available scientific literature.

The Circulation Unit processed 52,181 requests for loans (including 5,578 books located and borrowed from other libraries), and prepared 692 photoduplications.

During 1956 the Library shelved an aggregate of 171,341 items.

Translating Unit provided 562 hours of oral scannings, and 9,426 pages of typed translations from some 19 languages; translated into French and German those scientific papers to be given at international conferences or published in foreign journals; and loaned a total of 1,062 articles that were already translated.

Reported as a separate project is the program to translate and distribute Soviet scientific information in the biological and medical sciences.

Editorial Section

Approved (for the Director, NIH) 1,773 papers for publication. Furnished summaries of these papers to the Associate Director for Intramural Research.

Cleared and approved with the Chief, PHS Information Services, 103 press releases.

Processed 269 printing and duplicating requisitions.

Assembled 50 sets, four volumes each, of the "NIH Collected Reprints for 1955"; prepared and printed the author index; arranged for binding.

Issued the annual listing of "Papers Approved for Publication or Presentation, 1955" (1,395 titles) with an author index.

Photography Section

Conducted research on a variety of photographic problems and techniques.

Designed new equipment or attachments to meet specific research problems.

Provided the following central photographic services essential to the conduct of research, the documentation of research procedures, and the publication of research findings in both patient and nonpatient areas:

Black and white prints, 139,114;

Black and white slides, 24,393;

Color slides, 8,224;

Color transparencies, 14,370;

Black and white negatives, 51,194;

Photostats, 40,313;

Motion pictures, 18,285 feet.

Medical Arts Section

Provided scientific illustrating and related art services essential to the documentation of medical research activities, the publication of research findings, and for demonstration, exhibition, and training purposes.

Items prepared included:

3,632 charts, graphs, tables, and maps;

24 exhibits;

320 nonclinical illustrations for medical and biological studies and for publications and educational leaflets;

The design and format for 25 publications;

285 drawings of surgical procedures, pathological specimens, and precise anatomic subjects;

34 moulages of pathological specimens and anatomical abnormalities by developing models in wax, latex, plaster, or plastics;

Preserved 124 gross normal and pathological specimens of animal and human tissues and organs, using modern plastic methods of embedding and standard museum mounts.

Publications and Reports Section

This Section was established in 1956 as a focal point for the preparation and compilation of central NIH publications; editorial and technical assistance on special reports; and the production and distribution of materials for various information media.

During the year the P & R Section contributed the following:

Designed and wrote, or compiled and edited central NIH publications such as the NIH brochure and the Supply Management booklet;

Provided editorial and technical assistance in the preparation of special articles, periodic reports, and other materials (including DHEW's Annual Report) for the Office of the NIH Director;

Issued several press releases on the awarding of NIH research grants and on the establishment of new research training programs. Prepared bi-weekly press releases for Montgomery County newspapers, and furnished photographs and captions where indicated. Issued press releases on the appointment of Advisory Council members and NIH staff members;

Furnished general and technical information, scheduled interviews, provided visual materials, and reviewed copy for magazine and newspaper writers reporting NIH research;

Established a central NIH library for photographs and lantern slides on NIH programs and research advances, for use by NIH administrators and scientists. Organized and conducted a survey of clinical services, and planned the extension of this project into selected research areas. Furnished photographs to national magazines, newspapers, book publishers, and professional publications, such as Scope Weekly and Medical News, which reach 40,000 physicians;

Participated in the development of policy and procedures for the clearance of photographs to be used for information purposes;

Obtained and coordinated data on broad and specialized aspects of medical research for the Office of Research Information and Institute Information Officers;

At the request of Federal and non-Federal science writers, obtained general information on medical science, NIH personnel, direct and grant-supported research of the Institutes, and other subjects requiring extensive inquiry and analysis;

Furnished information and publication services to NIH constituents that have no Information Officer, such as DRS and DRG. Services for DRS included a thorough analysis of objectives and functions of DRS components, resulting in the preparation of a directory to the research services. P & R also prepared copy and art work, and the booklet is now in a final stage of clearance.

Provided a variety of central services, such as varityping, binding, technical consultation, distribution, and preparation of charts on NIH programs;

Established and maintained a central information file concerned with NIH programs, projects, events, and the broad aspects of health problems. This file and related facilities contain the bulk of project and reference materials from the former Office of the Chief, SRB.

Published bi-weekly NIH Record and weekly Calendar of Events.

The Publications and Reports Section presently contains ten members, two of whom are detailed to other Divisions. Recruitment of additional staff is in progress.

Special Events Section

Collaborated with other offices concerned with visitor reception, to develop procedures for fulfilling requests for NIH tours.

Received more than 6,600 visitors, representing 64 countries and territories.

Approximately 45 professional or lay organizations held meetings at NIH or arranged for groups of delegates to visit NIH.

Completed arrangements for the Fifth Annual R. E. Dyer Lecture, and for another in the series of lay lectures for NIH employees and their families.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DRS-3
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Revised brochure of the National Institutes of Health (PHS Publication No. 81)

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956.

A Superior Work Performance Award of $1200 was presented to 19 employees of the Photography Section at ceremonies held on October 8.

Vernon E. Taylor, Assistant Chief of the Photography Section, was appointed to the Council of the Photographers Association of America.

Medical Arts employee William E. Loechel received a $25 cash award for two suggestions--an improvement in transferring images from one sheet of material to another and for an improved means of solving the perspective problem in art work.

Three exhibits designed and constructed by the Medical Arts Section won four awards:

An exhibit depicting various dental activities of the Public Health Service won a certificate of honor at the 97th meeting of the American Dental Association.

An exhibit entitled "The Pilosebaceous Unit in Health and Disease" prepared for the National Cancer Institute was awarded first prize by the American Academy of Dermatology and Syphilology.

An exhibit entitled "The Malignant Carcinoid Syndrome" prepared for the National Heart Institute received two awards--first prize by the American College of Gastroenterology and a Certificate of Merit by the American Medical Association.

John E. Fletcher, Acting Chief of the Branch, received a Superior Service Award from HEW Secretary Marion B. Folsom on April 12.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-4
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Scientific Reports Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Library Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Russian Translation Program
PROJECT TITLE

7. Mr. Scott Adams, Librarian
PRINCIPAL INVESTIGATOR

8. Rosemary Roberts, Head, Translating Unit
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

The Congress, in appropriating funds to NIH for fiscal year 1957, earmarked an amount to provide for a broad program of translating and disseminating Russian publications in the biological and medical sciences. This new series to acquaint American scientists more promptly with the findings of Russian medical research is being established under the guidance of the NIH Librarian.

The program is coordinated with similar programs of the National Science Foundation and the Atomic Energy Commission in the fields of medicine and biology. It will be executed through grants and contracts.

By the end of 1956, the first issues of two journals--Biochemistry and Bulletin of Experimental Biology and Medicine--had been distributed to 300 American medical libraries, and arrangements had been completed to award a contract for the translation of six more journals.

Supplementing cover-to-cover journal translations for the specialty scientific fields, NIH has offered to translate papers to be selected by the editors of over 40 American journals. This project, which permits the editors to select according to the needs of the field, has met with enthusiastic response.

A grant of $40,000 has been awarded to the Excerpta Medica Foundation to translate and publish substantial blocs of Soviet abstracts; a Russian-English medical dictionary is assured for publication in the fall of 1957; a guide to scientific translation services will be published in March 1957; and the preliminary edition of a directory of Soviet research institutes will be issued in the spring of 1957.

NIH has made arrangements with the National Science Foundation to share the costs of the nonprofit translation pool maintained at the John Crerar Library, Chicago.

The Surgeon General has received a communication from A. A. Bakulov, President of the U.S.S.R. Academy of Medical Sciences, who has not only endorsed the program but has suggested the addition of another journal.

NO BUDGET DATA NECESSARY

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-4
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-5
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Laboratory Aids Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. All Sections
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. Dr. W. H. Eyestone, Chief, Laboratory Aids Branch
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION:

Objectives

To provide to all NIH investigators supportive service in the areas represented by the following Sections of the Laboratory Aids Branch: Instrument; Laboratory Glassware Preparation; Media; Animal Production; and Animal Hospital Section.

Methods Employed

Through the various LAB Sections, NIH investigators are provided laboratory animals; sterile glassware; bacteriologic media; design, construction, and maintenance services for intricate scientific instruments and equipment developed in collaboration with the research worker; surgical and X-ray facilities for animals; and quarantine and issuance service for dogs, cats, and monkeys.

Provision of these services requires technical and professional personnel, as in the construction of unique precision instruments not available from commercial sources; the control of genetics required to produce standardized animals essential to certain research studies; control of diseases in animal colonies; and postoperative care of dogs in the animal hospital.

A limited program of basic research is necessary in these areas. It is often inherent in the service itself; it helps attract competent people to these positions; and their accomplishments are very real contributions to medical science.

Accomplishments

Instrument Section:

Completed 4,100 projects requiring instrumentation. Of these, 81 percent cost $50 or less. Some developmental projects included a test tube filling and plugging machine; a universal operating stand; a combination pelvic screen and instrument stand for pelvic surgery; and an injector designed to introduce up to 40 gallons of fluoride into urban water supply systems. This injector was developed for the Division of Dental Resources, PHS.

Laboratory Glassware Preparation Section:

Processed and issued 3,456,000 pieces of laboratory glassware. Repaired 35,000 pieces of glassware at a savings of $18,000. Washed 380,000 pieces of animal cage equipment.

Media Section:

Filled 6,000 requests for media, and furnished tissue culture media such as Hank's, Earle's, Eagle's and 199 to all NIH investigators as requested.

Animal Production Section:

Increased animal production levels to a total of 948,582. Made substantial progress in reducing chronic respiratory disease in rats, improving quality along with quantity.

Animal Hospital Section:

Provided animal hospital facilities for 300 experimental surgery procedures, and furnished postoperative care and autopsy facilities. Produced 490 radiographs, and provided long-term

holding facilities for a minimum of 125 dogs. Issued 2,780 dogs, 1,017 cats, and 4,700 primates ~~of~~ to NIH investigators. Provided routine tuberculin testing to all NIH groups holding primates in their own areas.

Rockville Farm Unit:

Continued to improve holding facilities at the Rockville Farm Unit. The capacity at the end of 1956 is 12 horses, 28 sheep, and 40 dogs. During 1956 the Unit furnished NIH investigators with approximately 900 cc of sheep blood per week.

Problems

Because of increasing demands for more complex media, it is planned to consolidate the Media and the Laboratory Glassware Preparation Sections into one section, headed by a GS-13 Virologist.

In the production of laboratory mice, infantile diarrhea continues to be the leading health problem. It is urged that a substantial research program on the etiology of this disease be undertaken. Annual losses in animals and caretaking time would more than compensate for the program's cost.

So great has been the increase in the number of animals issued during 1956 that we are rapidly approaching the limits of our production capacity. If demands continue to mount, acute animal shortages in most categories will be felt within the first six months of 1957. Shortages of general-purpose mice have already developed.

Unless new space is made available during 1957, most animal production levels will remain at the 1956 level. An exception is rabbit production, which will show an increase as a result of the breeders set up during 1956, and those to be added early in 1957.

Considerable time was devoted by the Head, Animal Production Section, to liaison activities with the National Research Council and the Cancer Chemotherapy National Service Center. These activities involved the preparation of written material concerning genetic and husbandry standards, and conferences and field trips on matters pertaining to a nationwide scheme for mass production of inbred mice.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-6
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Natural History of Degenerative Joint Disease in Small Laboratory Animals
PROJECT TITLE

7. Dr. Leon Sokoloff, NIAMD
PRINCIPAL INVESTIGATOR

8. Dr. George E. Jay, Jr., DRS
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

To the best of our knowledge, this project did not resemble or parallel research done elsewhere in the Public Health Service, but it may have complemented other studies.

10. PROJECT DESCRIPTION

Osteoarthritis, or degenerative joint disease, is an important problem of public health. The lesions are present to a certain degree in virtually all persons entering the later years, and become progressively more severe.

The causes of osteoarthritis are not specifically known, but it has been speculated that trauma, disadvantageous posture, weight bearing, a variety of nutritional and hormonal factors, and possibly heredity play important roles in the etiology.

Animal experimentation on this condition has been limited by the lack of suitable animal material. Consequently, an extensive anatomical examination of the joints of small laboratory rodents has been made as a basis for an experimental study of the pathogenesis of degenerative arthritis.

The goals of this project have been several:

To determine whether the degenerative joint disease of these animals is comparable pathologically with that of man;

To determine which animals and which joints are most suitable for study;

To determine whether degenerative joint disease is an expression of skeletal aging as measured by other modalities;

To determine what factors may profitably be explored in future investigations;

To provide a useful anatomical guide in a field that will increasingly claim the attention of investigators concerned with diseases of aging.

Joints of 670 mice between 12 and 22 months of age, and 144 rats between 21 and 30 months, have been examined histologically. The mice comprised 18 inbred strains and the rats 8 inbred strains from the NIH Production Colonies. Details of the histological procedures can be found in the published papers listed in this report.

The results of these studies showed that (1) osteoarthritis in mice closely simulates its human counterpart in anatomical features, postural characteristics, and age groups; and (2) marked strain differences are evident in the incidence of the disease and in the degree of epiphyseal differentiation. These considerations as well as certain characteristics of the mouse--the omnivorous dietary habits, short life span, and availability of highly inbred strains--make this a suitable experimental animal for the study of osteoarthritis.

The rat proved resistant to the spontaneous development of osteoarthritis. A pattern of systic degeneration of articular cartilage is more frequently seen.

Experimental approaches to degenerative joint disease, involving all possible factors in the etiology, can now be made with the mouse material available at NIH. In fact, one of the strains (STR/IN) is only available here. Experiments on nutritional and genetic effects are now in progress, and experiments on other contributing factors are being planned.

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OCTOBER 1956
(ATTACHMENT 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

PART B: BUDGET DATA

11. DRS - 6
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS		MAN YEARS		
	DIRECT REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY '57	$500.00	$500.00	.05		.05

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY '57	.05		.05	

THIS REPRESENTS 20% OF DR. JAY'S RESEARCH TIME

13. BUDGET ACTIVITY:

RESEARCH	☒	ADMINISTRATION	☐
REVIEW & APPROVAL	☐		
BIOLOGIC STANDARDS	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

PROJECT CARRIED OUT IN COLLABORATION WITH DR. LEON SOKOLOFF, L.P.P., NIAMD.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-6
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

(1) Sokoloff, Leon, and G. E. Jay, Jr. Natural history of degenerative joint disease in small laboratory animals: 2. Epiphyseal maturation and osteoarthritis of the knee of mice of inbred strains. Arch. of Path., 62:129-135, 1956.

(2) Sokoloff, Leon, and G. E. Jay, Jr. Natural history of degenerative joint disease in small laboratory animals: 3. Variations in epiphyseal maturation in the head of the femur among inbred strains of mice. Arch. of Path., 62:136-139, 1956.

(3) Sokoloff, Leon, and G. E. Jay, Jr. Natural history of degenerative joint disease in small laboratory animals: 4. Degenerative joint disease in the laboratory rat. Arch. of Path., 62:140-142, 1956.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-7
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Breeding for Infantile Diarrhea Disease Resistance in Mice
PROJECT TITLE

7. Dr. George E. Jay, Jr.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

To the best of our knowledge this project does not resemble, complement, or parallel research done elsewhere in the Public Health Service.

10. PROJECT DESCRIPTION

Infantile diarrhea is probably the most serious health problem confronting a mouse production program. All production colonies are subject to the disease. Random-bred mice and some inbred strains show it only sporadically, whereas other closely inbred strains show it constantly. It is apparently influenced by seasonal changes, being more prevalent in the fall and winter months than in late spring and summer. The etiology of the disease is unknown despite considerable research.

A genetic susceptibility and/or resistance has been suspected, since differences in incidence have been noted between strains and even between substrains. Because of these observations, it seems possible that heritable resistance to the disease could be

promoted and fixed in a strain by genetic manipulation. The present project was undertaken to investigate this possibility in C_3H mice.

Animals for this project have been taken from the various substrains of C_3H available in the NIH colonies. By appropriate breeding and testing methods, it is hoped that a C_3H strain can be developed that will combine all the desirable characteristics.

The project is not far enough along to have produced tangible results. It will take at least another year to determine whether progress is being made. If the program is successful, it will mean a very substantial saving in the cost of C_3H mice, as well as a saving in time and effort by the scientific staff.

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(Attachment 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 7
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$500.00		$500.00	.05		.05

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	.05		.05	

FY'57 This represents 20% of Dr. Jay's research time

13. BUDGET ACTIVITY:

RESEARCH ☒
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-7
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-8
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Breeding for Respiratory Disease Resistance in Rats
PROJECT TITLE

7. Mr. Samuel M. Poiley
PRINCIPAL INVESTIGATOR

8. Dr. George E. Jay, Jr.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

To the best of our knowledge this project does not resemble, complement, or parallel research done elsewhere in the Public Health Service.

10. PROJECT DESCRIPTION

In the propagation and use of rats for laboratory research, chronic respiratory disease is the most important problem with which we must contend, and is generally the most important limiting factor in the use of this species. Attempts have been made to develop colonies of rats free of this chronic disease by creating special and rigidly controlled environments. Some of these efforts have been successful.

This project has approached the problem from the standpoint of genetics--through attempts to breed for resistance to the syndrome. The breeding details involve a series of backcrosses onto one strain (NIH Black, which is very resistant to the condition but a relatively poor breeder) with another strain (Sprague-Dawley, susceptible to the condition but a very good breeder).

These backcross matings will be followed by a close inbreeding and selection for color. It is believed that such genetic manipulations will eventually produce a type of rat that will manifest all the desirable characteristics.

At present, the project is in the third backcross with some degree of success already evident. Progeny of these backcrosses have been autopsied, with very little evidence of lung involvement. Some of these backcross progeny were approximately nine months of age at autopsy. Much more work is necessary before the new strain can be developed and put into production. If these efforts are successful, they should result in a substantial saving to NIH.

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(Attachment 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 8
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY '57	$1700		$1700	.20		.20

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY '57	.20		.20	

This represents 67% of Mr. Poiley's and 40% of Dr. Jay's research time.

13. BUDGET ACTIVITY:

RESEARCH ☒
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-8
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-9
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Strain Differences in Response to Various Drugs
PROJECT TITLE

7. Dr. George E. Jay, Jr.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

To the best of our knowledge, this program may resemble and complement, but does not parallel, other programs in the Public Health Service.

10. PROJECT DESCRIPTION

Previous work by this investigator has shown marked differences between various inbred strains of mice in response to a barbiturate. This work is being continued to investigate other barbiturates.

The data are only preliminary at this time. There are indications, however, that strain differences in responses are similar to those previously reported, but in a different order of magnitude. Further work will undoubtedly clarify the pattern.

This work may be significant to various fields of research. Strain differences in response to drugs could be of considerable importance in routine pharmacologic testing, or in basic studies of drug metabolism. It is likely that one approach to the study of metabolic pathways in small mammals can be made through the use of genetically uniform animals in combination with pharmacologic techniques.

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(Attachment 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 9
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$300		$300	.025		.025

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	.025		.025	

This represents 10% of Dr. Jay's research time.

13. BUDGET ACTIVITY:

RESEARCH ☒
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☐

ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-9
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956;

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

Form No. ORP-1
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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-10
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Caging Research and Development
PROJECT TITLE

7. Mr. Samuel M. Poiley
PRINCIPAL INVESTIGATOR

8. In collaboration with scientists from various Institutes
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

To the best of our knowledge, this project does not resemble, complement, or parallel research done elsewhere in the Public Health Service.

10. PROJECT DESCRIPTION

This project encompasses all aspects of research on the development and design of caging equipment for laboratory animals.

During the past year, new types of caging equipment were designed and tested at the request of, and in collaboration with scientists from various Institutes. In addition, some of the existing types of cages were redesigned to permit better utilization of the equipment and accessories. The new items and redesigned items are as follows:

New Items for NIMH and/or NINDB

Monkey observation cage

Monkey observation cage for metabolic studies

Adjustable monkey enclosure

Infant monkey cage and stand

Monkey transfer cage and stand

Chimpanzee cage

Nest boxes and simulated rat burrows (compact and extended)

New Item for NIAMD

Suspended rat cage with door and stand

New Items for Animal Production Section or General Use

Food hopper for rat maternity cage

Magnetic door latch

Redesigned Item

General-purpose cage revisions

Work on this project is continuing from year to year. Though there are standard items of caging equipment at NIH, they are in constant need of revision, either for use in the Animal Production Section or in the various research areas.

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PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 10
SERIAL NUMBER

12. BUDGET DATA:

ESTIMATED OBLIGATIONS			MAN YEARS		
DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
$200		$200	.025		.025

FY'57

BUDGETED POSITIONS			PATIENT DAYS
PROF	OTHER	TOTAL	
.025		.025	

FY'57 Represents 16.5% of Mr. Poiley's research time.

13. BUDGET ACTIVITY:

RESEARCH ☒
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

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October 1956

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-10
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

Form No. ORP-1
October 1956

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-11
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Research in Animal Husbandry Practices and Procedures
PROJECT TITLE

7. Animal Production Staff
PRINCIPAL INVESTIGATOR

8. In cooperation and collaboration with Dr. R. Habermann and staff
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OR PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

This program may resemble, parallel, and/or complement other programs in the Public Health Service.

10. PROJECT DESCRIPTION

Husbandry practices and procedures in the care and maintenance of laboratory animals are always subject to changes and revisions. Consequently, research studies on housing, feeding, cleaning, breeding, sanitary procedures, etc., are an integral part of any production colony activities. The present project is concerned with matters of this type.

During the past year, typical subjects of study have been as follows: the use of antibiotics and other drugs in the control of disease, optimal population numbers in cages, use of various bedding materials, testing of guinea pig rations, testing of various dietary supplements, and handling procedures for mothers and litters.

The results of these experiments, applicable in many cases to NIH alone, have not been published. Some produced negative results, while others provided sufficient information to warrant altering certain routine procedures.

Research of this type will continue, for it forms the basis for improved colony management. Any improvements will result in an increased quality and quantity of experimental animals at NIH.

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(Attachment 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 11
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$400		$400	.05		.05

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	.05 This represents 10% of Dr. Jay's and 16.5% of Mr. Poiley's research time.		.05	

13. BUDGET ACTIVITY:

RESEARCH	☒	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☐		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH, INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-11
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-12
SERIAL NUMBER

2. DIVISION OF RESEARCH SERVICES
INSTITUTE OR DIVISION

3. LABORATORY AIDS BRANCH
LABORATORY, BRANCH, OR DEPARTMENT

4. ANIMAL PRODUCTION SECTION
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Animal Caretaker Training Program
PROJECT TITLE

7. Animal Production Section Staff
PRINCIPAL INVESTIGATOR

8. In collaboration with various Institutes
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

This program may resemble but probably does not parallel or complement administrative programs in the Public Health Service.

10. PROJECT DESCRIPTION

The increase in biological research, and the consequent recognition of the importance of satisfactory subject material for these programs, has given rise to a need for evaluation and improvement of present day animal caretaking programs at NIH.

In the past and even today, animals at NIH have sometimes been subjected to caretaking procedures compounded of scientific knowledge, rule of thumb, "old wives tales," lack of proper supervision, and unsympathetic approaches to the needs of the animals. The resultant confusion and mismanagement have adversely influenced experimental studies, leading to possibilities of erroneous conclusions. Current caretaking practices in the Animal Production Section are designed to eliminate conflicting factors and to establish

uniform baselines. This in itself is no solution if identical methods are not followed in laboratory animal quarters.

In recognition of these discrepancies in caretaking procedures, the animal production staff has proposed a long-term training program designed to provide a continuing supply of trained animal caretakers to the research areas and to the central animal facilities at NIH. It is the studied opinion of the animal production staff that such a program would be of great value in standardizing caretaking procedures here, and increasing the efficiency of recruiting and training caretakers. It is urged that this program be adopted as soon as possible.

NO BUDGET DATA NECESSARY

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-12
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-13
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Laboratory Aids Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Animal Hospital Section
SECTION OR SERVICE

LOCATION (IF OTHER THAN BETHESDA)

6. Animal Surgery
PROJECT TITLE

7. William I. Gay, D.V.M.
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Part of the shaft of supporting long bones has now been replaced with a metal prosthesis contained entirely within the medullary canal. The prosthesis was constructed of titanium, a metal used for the first time in a prosthetic device. It satisfactorily supported the weight of the limb while the bone defect was healing. The device has been used in the radius and tibia of the dog.

In recent experiments, the same prosthetic device has shown promise of providing a satisfactory solution to the problem of lengthening long bones.

Iodinated organic compounds used as radiographic contrast media are being studied as a means of early evaluation of experimental surgical results in dogs, without sacrificing the animal. Radiographs from this study were used as a display at the D. C. Veterinary Medical Society meeting in November 1956.

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PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS - 13
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57	$400		$400	.05		.05

	BUDGETED POSITIONS			PATIENT DAYS
	PROF	OTHER	TOTAL	
FY'57	.05		.05	

FY'57 Represents 100% of Dr. Gay's research time.

13. BUDGET ACTIVITY:

RESEARCH ☒
REVIEW & APPROVAL ☐
BIOLOGIC STANDARDS ☐
ADMINISTRATION ☐
PROFESSIONAL & TECHNICAL ASSISTANCE ☐

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-13
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

(1) Gay, William I., D.V.M., Recent Advances in Orthopedic Surgery Applicable to Canine Practice. Southwestern Veterinarian.

(2) Gay, William I., D.V.M., The Public Health Significance of Drugs in Animal Feeds. (Junior Author) Proceedings of the Symposium on Medicated Feeds.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-14
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Biometrics Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. All sections
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. Dr. Harold F. Dorn, Chief, Biometrics Branch
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

To provide to all NIH investigators services in three major areas: (1) Consulting in the design, execution and analysis of the results of experiments and studies; (2) planning and conducting research investigations, usually in collaboration with other scientists; and (3) providing central statistical processing services.

During 1956 major changes were made in the planning for the first and third of these activities.

Accomplishments

A plan for the training of biometricians and epidemiologists was approved by the Institute Directors, and special funds have been set aside to strengthen in these two areas the training programs

of medical schools, schools of public health, and selected universities. Funds have also been requested in the 1958 budget for on-the-job training of biometricians at NIH.

Demand for the services of the Statistical Processing Section has been increasing more rapidly than the expansion of facilities for rendering service. This resulted in regular overtime work for the Section's staff. Therefore, in early 1956, the desirability of changing from electrical accounting machines to electronic data processing equipment was considered. A request for funds for this project was included in the preliminary 1958 budget. A committee appointed by the Director, NIH, to study the problem recommended that NIH immediately proceed with plans for the installation of the electronic equipment. Responsibility for the administration and development of the program was placed in the Biometrics Branch.

Problems

In January 1956, approximately 30 biometricians of grades GS-7 and above were employed. A review of future programs planned by the various Institutes and Divisions suggests that perhaps 25 to 30 additional biometricians may be needed within the next four or five years.

The demand for biometricians is increasing rapidly, and during 1956 exceeded the number becoming available from colleges and universities. The need for additional trained epidemiologists is also apparent. To meet the prospective needs of NIH, some sort of training program to counter these dual shortages seems essential.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-15
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Biometrics Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Relationship of the Use of Tobacco to Health
PROJECT TITLE

7. Harold F. Dorn
PRINCIPAL INVESTIGATOR

8. William S. Baum and R. F. Kaiser
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives. To determine differences in mortality from specific causes of death among persons with varying habits with respect to the use of tobacco; to investigate factors other than tobacco--for example, occupation and residence--which also may account for the observed differences in mortality.

Methods. Information concerning residence, occupation, and the use of tobacco is being collected from about 290,000 persons who held U. S. Government Life Insurance policies in December 1953. As each person included in the study terminates a policy, the Biometrics Branch is notified by the Veterans Administration. If the policy is terminated as a result of death, information is collected from physicians and hospitals concerning the causes of death and the methods of establishing these diagnoses.

Major Findings. No results from this investigation have yet been published.

Course of Project. It is expected that this project will continue for an indefinite period of years. Analysis of habits with respect to the use of tobacco, and some aspects of differential mortality, will be made within the next year or two.

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(Attachment 1)

PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

PART B: BUDGET DATA

11. DRS-15
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY '57		$13,300	$13,300	0.05	2	2.05

	BUDGETED POSITIONS			PATIENT DAYS	NONE
	PROF	OTHER	TOTAL		
FY '57	.05	2	2.05		

13. BUDGET ACTIVITY:

RESEARCH	☒	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☐		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH, INDICATE SERIAL NO(S):

Cancer Institute

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-15
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-16
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Biometrics Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Differential Mortality in Metropolitan and Non-Metropolitan Areas
PROJECT TITLE

7. Harold F. Dorn
PRINCIPAL INVESTIGATOR

8. Nicholas E. Manos, Division of Special Health Services
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

This project is part of investigations of the effect of air pollution upon health carried out by the Air Pollution Medical Program of the Division of Special Health Services.

10. PROJECT DESCRIPTION

Objectives. To determine variations in mortality by age, sex, color, and cause among the 119 economic subregions of the United States and metropolitan and non-metropolitan areas.

Methods Employed. The official death records for the three-year period 1949-51 for the United States have been retabulated to permit the computation of mortality rates for 100 causes of death by age, sex and color for each of the 119 economic subregions of the United States and for each of the metropolitan areas as defined by the Bureau of the Census. Each metropolitan area has been classified so that data are available separately for the county or counties in which the central city is located and for other counties included in the metropolitan area.

Major Findings. At the present time, the basic tabulation has been completed and the computation of mortality rates is expected to be completed by the end of fiscal year 1957.

Proposed Course of Project. From one to two years will be required to complete the analysis of these data.

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PUBLIC HEALTH SERVICE---NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part B: Budget Data

11. DRS-16
SERIAL NUMBER

12. BUDGET DATA:

	ESTIMATED OBLIGATIONS			MAN YEARS		
	DIRECT	REIMBURSEMENT	TOTAL	PROF	OTHER	TOTAL
FY'57		$21,600	$21,600	0.01		0.01

	BUDGETED POSITIONS			PATIENT DAYS	
	PROF	OTHER	TOTAL		NONE
FY'57	.01		.01		

13. BUDGET ACTIVITY:

RESEARCH	☒	ADMINISTRATION	☐
REVIEW & APPROVAL	☐	PROFESSIONAL & TECHNICAL ASSISTANCE	☐
BIOLOGIC STANDARDS	☐		

14. IDENTIFY ANY COOPERATING UNITS OF THE PUBLIC HEALTH SERVICE, OR OTHER ORGANIZATIONS, PROVIDING FUNDS, FACILITIES, OR PERSONNEL FOR THIS PROJECT IN FY 1957. IF COOPERATING UNIT IS WITHIN NIH, INDICATE SERIAL NO(S):

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-16
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-17
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Biometrics Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Office of the Chief
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Statistical Consultation to Intramural Research Projects
PROJECT TITLE

7. Harold F. Dorn
PRINCIPAL INVESTIGATOR

8. Jerome Cornfield and Jacob E. Lieberman
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

The purpose of this activity is to provide statistical advice in the design and execution of research projects at the National Institutes of Health. This is carried out by having the biometrician work closely with the individual investigators directing specific projects.

NO BUDGET DATA NECESSARY

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-17
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

(1) Dorn, Harold F. Some Problems for Research in Mortality and Morbidity. Public Health Reports, Vol. 71, No. 1, January 1956.

(2) Dorn, Harold F. Ecological Factors in Morbidity and Mortality from Cancer. Trends and Differentials in Mortality, Proceedings of a Round Table at the 1955 Annual Conference, Milbank Memorial Fund.

(3) Cornfield, Jerome. Lung Cancer in Women - A Study of Etiological Factors. Ernest L. Wynder, Walter O'Donnell, Irwin Bross, New England Journal of Medicine, December 13, 1956.

(4) Cornfield, Jerome. A Statistical Problem Arising from Retrospective Studies. Proceedings of the Third Berkeley Symposium on Mathematical Statistics and Probability, University of California Press, 1956.

(5) Cornfield, Jerome. Average Values of Mean Squares in Factorials. John W. Tukey, Annals of Mathematical Statistics, December 1956.

(6) Cornfield, Jerome. Studies on the Metabolism of Amino Acids and Related Compounds in vivo. I. Toxicity of Essential Amino Acids, Individually and in Mixtures, and the Protective Effect of L-Arginine. Archives of Biochemistry and Biophysics, Vol. 64, No. 2, pp. 319-332, October 1956. With P. Gullino, M. Winitz, S. M. Birnbaum, M. C. Otey, and J. P. Greenstein.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Dorn, Harold F. President-Elect of Population Association of America; Scientific Advisory Council of the American Cancer Society; Member of National Health Survey - Departmental Advisory Committee; Advisory Committee on Epidemiology and Biometry.

Cornfield, Jerome. Executive Committee, Washington Statistical Society.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-18
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Biometrics Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Statistical Processing Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Statistical Processing
PROJECT TITLE

7. Charles Greene
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

The purpose of this activity is to provide central facilities and services by means of electrical accounting machines for accounting, administrative, and statistical activities. Within the limitations of available personnel and equipment, this Section processes data upon the request of the various Institutes and Divisions of the National Institutes of Health.

NO BUDGET DATA NECESSARY

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications 15. DRS-18

16: LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-19
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Sanitary Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. All Sections
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. D. L. Snow, Chief, Sanitary Engineering Branch
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH)

10. PROJECT DESCRIPTION

Objectives

The SEB program centers around its principal objective of improving all phases of sanitation at NIH, and is especially slanted towards solving sanitation problems peculiar to hospital and laboratory environments. A parallel function of the SEB is directed towards the study and control of those facilities and utilities which can directly influence the conduct of research.

Thus, SEB is concerned with such broad areas of environmental interest as air hygiene; water, milk and food sanitation; waste collection and disposal; insect and rodent control; surface sanitation and general cleaning problems; sanitary design features in new buildings and equipment; control of noise, sound and vibration; control of the quality of distilled and demineralized water; and control of various sterilization processes.

Methods Employed

For new buildings and major renovations, criteria and specifications for sanitary design are furnished and construction plans reviewed.

The insect and rodent control crew provides sanitary surveillance of existing facilities through building-wide surveys and daily reports.

Sanitary guidance, including the preparation of necessary instructions or regulations, is furnished whenever needed.

In instances where technical information is lacking, SEB conducts laboratory-scale, pilot-plant, or field investigations.

Another approach, and the one in which the greatest unfilled need remains, is that of employee education. SEB regularly participates in the nursing attendants' training courses, and furnishes sanitation lecture materials used in the training program for Nutrition Department employees. Elements for an animal attendants' training program are being prepared.

Accomplishments

Specific accomplishments during 1956 include: Establishment of a small germ-free animal facility within the SEB testing area; release of the first building environmental report in cooperation with the NIH Environmental Health Advisory Group; final design and development of the NIH waste-chemical disposal facility; a study of vibration problems inherent in a typical laboratory building, and their significance in scientific instrumentation; studies and designs in connection with the proposed DBS building.

Problems

The Branch considers its greatest program deficiencies to be in the areas of maintaining regular surveillance on the quality of distilled water; sampling and studies of laboratory atmospheres for dust, and biological and chemical contaminants; staffing for the chemical and bacteriological disciplines needed to explore more fully the Branch's problems.

Projected Plans for Future Work

For the coming year, SEB is looking forward to such goals as a more active program for the environmental surveys of buildings; perfection of the various waste-handling systems; introduction of an integrated chemical-waste disposal system; more emphasis on employee sanitation training; and a more integrated type of development and research wherein chemical and bacteriological disciplines will be intimately involved.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-20
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Sanitary Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Plant Sanitation Services
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Plant Sanitation Services (Formerly: Distilled Water Production; Laboratory Glassware Surface Contaminants and Their Removal; Effective Sealing of Conductive Terrazzo Operating Room Flooring)
PROJECT TITLE

7. Harry Stierli, Senior Sanitary Engineer
PRINCIPAL INVESTIGATOR

8. Donald L. Snow, Sanitary Engineer Director, John L. S. Hickey, Sanitary Engineer
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

To determine the criteria for clean surfaces on animal cages, laboratory glassware, operating room floors, and other surfaces which are critical to the conduct of research or the maintenance of human or animal health;

To study equipment, materials, and methods of removal of soil from these surfaces;

To improve the quality of distilled water, deionized water, and other special process-water used in research;

To study new sterilization equipment and methods, and to determine safe and effective criteria for their use;

To establish effective quality controls for central cleaning facilities, process-water systems, sterilizers, animal caging equipment, and other facilities of vital import in the maintenance of good sanitation.

Methods Employed

The visual inspection of surfaces, combined with physical, chemical, and bacteriological tests and experimental statistical methods are used, and are being further developed in order to determine and define cleanliness.

Selected and newly developed detergents, disinfectants, and sanitizers are evaluated.

New equipment and methods of sterilizing clinical and research apparatus, including heat-sensitive materials, are studied.

The purity of distilled water and other process-waters is checked by physical and chemical tests.

Functional layouts and specifications are prepared for new facilities and equipment involving sanitation and quality-control problems.

A combination of laboratory studies, pilot-scale tests, and field investigations is utilized to acquire accurate, practical solutions of problems.

Problems and Accomplishments

The improvement of existing NIH facilities to achieve and maintain an exemplary clean environment is a major plant sanitation problem.

Instruction of supervisors and other personnel in the proper operation and maintenance of animal cage-washing machines, water stills, sterilizers, and other equipment is critical to the attainment of good sanitation and quality control.

A third typical problem is the control of trace-element contamination on laboratory glassware surfaces, and in distilled waters.

Typical accomplishments during 1956 included the preparation of various functional layouts and equipment specifications for new and renovated facilities such as employed in animal cage cleaning, laboratory glassware cleaning, distilled water production, and sterilization.

Significance to NIH Research

An effective plant sanitation program is basic to the conduct of research. For example, the precision control of ionizable solids in distilled waters, combined with routine analyses for trace metal impurities, is required for investigations involving tissue culture and enzyme chemistry.

Further, the study of newly developed automatic gas sterilization equipment is necessary in order to keep pace with scientific instrumentation in which plastics and other heat-sensitive or corrosion-susceptible materials play an important part.

The continued promotion of mechanized glassware and cage-cleaning equipment for additional application at NIH may also be expected to result in more effective and economical cleaning operations.

Proposed Course of Services

Study of the criteria for clean surfaces will continue, with emphasis on development of methods for inspection and testing of laboratory glassware equipment for trace element contaminants.

More attention will be given to evaluation of detergents, disinfectants, and sanitizers.

Routine analyses of centrally distilled waters for ionizable solids and trace metal impurities will be established to ensure quality control of distillates used in research.

Evaluation will be made of newly developed equipment for gas sterilization.

New animal cages and other equipment related to plant sanitation will continue to be inspected for conformance to specifications.

Functional layouts and equipment specifications will be prepared for new and remodeled facilities.

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-20
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

Laurence R. Crisp and Harry Stierli, Automatic Pipette Washing Machine, United States Department of Commerce, Office of Technical Services, PB 111745

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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October 1956

Calendar Year 1956

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-21
SERIAL NUMBER

2. Division of Research Services
INSTITUTES OR DIVISION

3. Sanitary Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Environmental Health & Industrial Hygiene Services (formerly Laboratory & Hospital Sanitation Services)
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Environmental Health & Industrial Hygiene Services (formerly Laboratory & Hospital Sanitation Services)
PROJECT TITLE

7. Donald L. Snow, Chief, Sanitary Engineering Branch, and Floyd B. Taylor, Senior Sanitary Engineer
PRINCIPAL INVESTIGATOR

8. John L. S. Hickey, Sanitary Engineer
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

The objectives of these services are to promote, develop, and apply standards of environmental health and industrial hygiene to the unique laboratory and patient care environment of the National Institutes of Health.

Methods Employed

Evaluation of NIH environmental conditions by inspections, investigation of reported incidents, special surveys and original laboratory or pilot plant findings.

Preparation and submission of formal reports with recommendations for new or corrective action.

Cooperative work with various NIH operating Branches and Departments on matters of common environmental interest-- e.g., nursing attendants training classes.

Cooperation in developing the NIH Environmental Health Advisory Group program.

Major Findings

Development of waste-chemical disposal methods, and design of a complete treatment plant, including utilization of a method employing oil burner principles for disposal of waste solvents.

Development and promotion of additional refinements to NIH solid-wastes handling system, such as plastic liners for GI refuse containers.

Definition of the basic elements involved in problem of vibration and its interference with operation of sensitive scientific instruments, and design of a vibration damping mount for instruments.

Completion and testing of the Clinical Center hydrotherapy pool, based on designs developed by this service in 1955.

Completion of the Building 6 environmental-health survey report and promotion of remedial measures.

Significance to NIH Research

Optimum environmental conditions for research activities tend to decrease health and safety problems and to provide a significant measure of quality control in research. For example, waste-chemical disposal methods, when implemented by the construction of a treatment plant, will help eliminate many present hazardous chemical storage and disposal practices. In another instance, the new plastic liners for cans resulted in substantial savings in the design of the new Biologics Standards Building through elimination of the need for a building incinerator and an incinerator operator's salary. This single development has brought about safer and more economical procedures for the collection and disposal of infectious wastes at a central point, rather than in small, decentralized incinerators.

Further, progress in the field of vibration control points to solution of the troublesome problem of vibratory interference in the use of research instruments.

Proposed Course of Project

It is planned to press for completion of the waste-chemical disposal plant and, in turn, to develop a system for waste chemicals collection; to develop and promote methods of vibration control and to promote continual environmental health surveys of NIH buildings.

A concentrated attack on atmospheric dust and other pollutants in laboratory atmospheres will be initiated in the coming year. Special attention will be devoted to meteorological conditions and their effects on laboratory exhaust-gas short-circuiting phenomena.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-21
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

(1) Hospital Solid Wastes and Their Handling. Am. Journal of Public Health, V.46, No. 3, Mar. 1956. (Contributed data and prepared above APHA committee report.)

(2) Snow, D. L. Elements of Industrial Sanitation 1. Structural Planning. Modern Sanitation, Nov. 1956.

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

Participation by D. L. Snow as conference member, Sept. 17, 1956, in the Conference on Disposal of Infectious Wastes from Hospitals, of the National Research Council's Subcommittee on Waste Disposal.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-22
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Sanitary Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Insect and Rodent Control Section
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Institutional Insect and Rodent Control
PROJECT TITLE

7. Robert D. Murrill
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

To establish an effective control program against insects and rodents at NIH, and to improve the research environment at NIH through the development of minimum sanitation standards for animal rooms.

Methods Employed

Sanitation. By development of minimum sanitation standards, especially in such critical areas as animal rooms, and continuous consultation with the service units and individuals directly responsible for cleaning.

Education. By aiding in the development of a training course for animal room attendants, and by frequent personal contacts with the attendants.

Inspection. By frequent, informal, nonroutine inspections of animal rooms and animals.

Pesticide Application. As a supplement to basic sanitation, by applying pesticides for the control of insects and rodents.

Major Accomplishments

The Section has been successful in keeping insects and rodents under control in all NIH buildings but one.

Sanitation standards in animal rooms have been maintained and in some instances raised above those existing at the beginning of the year.

Significance to NIH Research

Public Health. An environment free of insects and rodents indicates that at least minimum sanitation standards are being met.

Public Relations. The proximity of experimental animals and patients in the Clinical Center dictates the need for caution in the handling of animals to prevent their escape, and in caring for the animals so that no conditions attractive to insects will develop.

Research Environment. Insect and rodent control is considered a necessary element of the NIH research environment. The control and elimination of insects and escaped animals from research buildings removes some of the unknown factors in animal research, such as insect bodies and feces in the animal diets, loss of blood to insects, irritation or lack of rest, and the potential for rodent- or insect-transmitted disease.

Proposed Course of Project

Training. Training courses for animal room attendants are being planned, with the purpose of raising further the sanitation standards of animal rooms.

Housekeeping. By participating in the Environmental Health Advisory Group building surveys, the Insect and Rodent Control Section expects to uncover additional possible sources of insect and rodent infestation within the NIH buildings.

Resistance to Insecticides by Insects. The ability of some species of insects to develop resistance to organic insecticides has been known for several years. It is believed that house flies at NIH have developed resistance to DDT; therefore, this insecticide was not used during 1956 for housefly control. A very careful watch will be made during 1957 to determine whether other insects become resistant to any of the several insecticides used by this Section.

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-22
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

Form No. ORP-1
October 1956

Calendar Year 1956

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-23
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Sanitary Engineering Branch
LABORATORY, BRANCH, OR DEPARTMENT

4. Germ-Free Research Services
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6. Germ-Free Research Services
PROJECT TITLE

7. D. L. Snow
PRINCIPAL INVESTIGATOR

8. John L. S. Hickey
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS) IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

The ultimate goal of the Germ-Free Research Service is to provide the scientific investigator with a dependable supply of several varieties of germ-free animals in conveniently operated and economically constructed tanks or containers. Further, it is an objective to develop the use of germ-free animals around the individual laboratory rather than the central facility.

Methods Employed

The methods employed to attain these objectives involve three stages: Training of personnel in the germ-free technique and use of equipment; development of simple and comparatively inexpensive germ-free equipment to encourage its widespread use at NIH; and development and maintenance of a central germ-free animal colony of sufficient size to provide a dependable supply of animals to investigators.

Significance of Project to NIH

The research potential of the germ-free animal has scarcely been touched. By making germ-free animals available to the investigator in his own laboratory to use at his own convenience, it is hoped that the potential uses of a germ-free animal as a research tool can be more fully exploited.

Proposed Course of Project

SEB will continue to maintain the present temporary germ-free facility and its equipment for training, and for experiments held in cooperation with interested Institutes.

At the same time, development of new equipment and procedures will be continued. Eventually, it is planned that animal production will be the responsibility of SEB and LAB, with animals being distributed to Institute investigators in easily transportable containers.

Short training courses will be held for laboratory personnel expected to maintain the germ-free chamber in the laboratory. A central service for bacteriological controls will be provided.

Present Status of Project

The training of personnel in germ-free techniques is well under way. To date, 34 guinea pigs have been delivered by NIAID personnel under sterile conditions. To utilize fully the training period, trichomonas implantation studies are being carried on by NIAID.

Additional germ-free units and accessory equipment have been requisitioned, with modifications found necessary by use of present equipment, such as improved lighting of surgical field.

Several basic approaches to germ-free methodology (such as sterilization of equipment and materials by irradiation) are being studied by SEB jointly with the University of Pennsylvania-Walter Reed AMC germ-free group. It is hoped that a prototype portable germ-free chamber will be ready for testing by July 1957.

The SEB and the Walter Reed group have jointly worked out a design with one manufacturer for a glove which will fit both present and future equipment. The glove is in production and will soon be ready for testing.

NO BUDGET DATA NECESSARY

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PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-23
SERIAL NUMBER

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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October 1956

Calendar Year 1956

PUBLIC HEALTH SERVICE - NATIONAL INSTITUTES OF HEALTH

INDIVIDUAL PROJECT REPORT

Part A. Project Description Sheet

1. DRS-24
SERIAL NUMBER

2. Division of Research Services
INSTITUTE OR DIVISION

3. Research Facilities Planning Branch
LABORATORY, BRANCH, OR DEPARTMENT

4.
SECTION OR SERVICE

5.
LOCATION (IF OTHER THAN BETHESDA)

6.
PROJECT TITLE

7. L. M. Runkle, Acting Chief
PRINCIPAL INVESTIGATOR

8.
OTHER INVESTIGATORS

9. IF THIS PROJECT RESEMBLES, COMPLEMENTS, OR PARALLELS RESEARCH DONE ELSEWHERE IN THE PUBLIC HEALTH SERVICE (WITHOUT INTERCHANGE OF PERSONNEL, FACILITIES OR FUNDS), IDENTIFY SUCH RESEARCH: (BY SERIAL NO. (S) IF WITHIN NIH).

10. PROJECT DESCRIPTION

Objectives

To serve as the focal point at NIH for the assembly and correlation of information required in planning the construction of all new research facilities and the alteration of existing facilities.

Reorganization

A reorganization in the Division of Research Services, necessitated by the demands of the new building program at NIH, resulted in the establishment of RFPB on October 1, 1956.

The Assistant Chief, PEB, was assigned as Acting Chief, RFPB. An engineer of the Commissioned Corps, and a secretary were also assigned to the staff.

Accomplishments

Bg. 29, New DBS Building. Reviewed and approved the contract architect's tentative plans for a new DBS laboratory building. Data on the proposed laboratory equipment now being assembled.

Bg. 30, New Dental Building. RFPB and the Dental Committee collaborated in preparing program requirements for the architect.

Bg. 31, New Office Building. RFPB and DBO collaborated in preparing program requirements for the architect.

Bg. 14, Wings A and C. RFPB worked with PBS in obtaining release for this project by the Bureau of the Budget. Contract was awarded by PBS to the John A. Volke Construction Co. for $1,116,000.

Bg. 28, Wings A and C. Approved PBS plans for the proposed wings. Bids for this work were opened at PBS on December 19, 1956.

Bg. 8, Germ-Free Laboratory. RFPB and SEB reviewed PBS plans, and began review to determine what portion of this project may be reduced in order to permit construction within available funds.

Bg. 10, New CC Operating Wing. Prepared a tentative program for this project, based on tentatives prepared by NIA. A new Surgical Facilities Committee was formed, however, to establish criteria for a revised program. RFPB has been assembling data on the needs of the ancillary organizations to be housed in this wing.

Master Site Plan. Reviewed the plan prepared by PBS. NIH has contracted with Gilman D. Clarke, consulting landscape architect, to review the master site plan.

Bethesda Fire Station. Approved the architect's plans for the new fire station to be constructed by the Bethesda Fire Department at the corner of Cedar Lane and Old Georgetown Road.

Problems

A position for one mechanical engineer was approved, but no suitable applicant could be found during 1956.

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INDIVIDUAL PROJECT REPORT

Part C: Honors, Awards & Publications

15. DRS-24

16. LIST PUBLICATIONS OTHER THAN ABSTRACTS FROM THIS PROJECT DURING CALENDAR YEAR 1956:

None

17. LIST HONORS AND AWARDS TO PERSONNEL RELATING TO THIS PROJECT DURING CALENDAR YEAR 1956:

None

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